FOOD INDUSTRIES

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★ ***Homes of Famous Foods***

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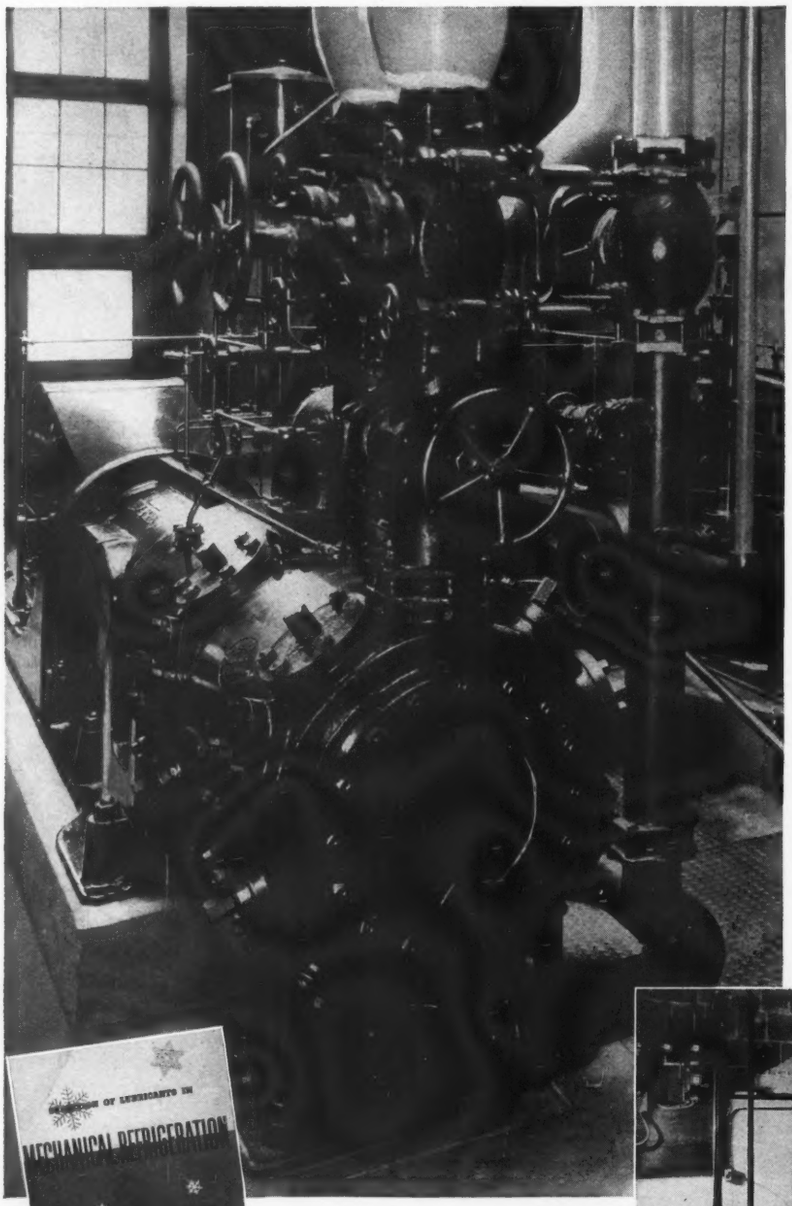
EVEN AT SUB-ZERO TEMPERATURES...



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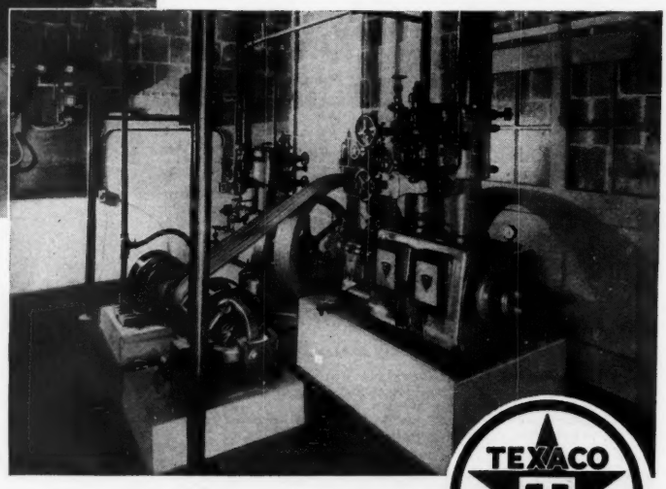

This 200-ton Vilter Compressor—installed in a brewery—and the Creamery Package vertical ammonia compressor differ widely in their lubrication requirements. Texaco Capella Oils meet the needs of both. Six grades, ranging in viscosity from 80 to 500 sec. SUV at 100 deg. F., are available in 55-gallon sealed drums, and 5- or 1-gallon resealable cans.

TEXACO

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FOOD INDUSTRIES

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Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 10, No. 5

Laurence V. Burton, Editor

•

MAY 1938

The Talk of the Industry

» So THE Great White Father stayed up very late two nights to write his spendthrift message to Congress. Balmy evening air in spring often makes a man decide to shoot the works.

It would be far more pleasing to learn of his staying up nights to find ways to save our money instead of blow it.

» AS A SIMPLE MATTER of public relations, it would be of great interest to know the difference between frozen cream and ice cream. From the standpoint of public relations there seems to be no essential difference. But some ice cream manufacturers seem to believe that there is a difference—that cream which contains sugar, flavor, etc. may be frozen, but cream alone may not be frozen without incurring some form of hostile criticism from the lay public. Or does it originate with competition?

» SPEAKING OF COMPETITORS, the thought frequently recurs that a theme worthy of a special issue of FOOD INDUSTRIES would be "Why My Competitor Should Be in Jail." It ought

to make fascinating reading. But when we see competitors at conventions, spinning good yarns around the big table in the tap room, or raising their voices in song, we wonder who could be persuaded to be the authors of such a symposium.

» COMPETITION, it must be noted, is not always confined to the manufacturing industries—food or otherwise. Recently it has been observed in the legal profession. One well known lawyer is said to have been "lifting" another w.k. lawyer's published comments and presenting them as his own convictions and analyses, all without credit to the former.

They do say that some day, ere long, there may appear one of those deadly parallel column publications of two separate legal comments on the same subject. And won't that be somethin'!

» GOVERNMENT SPENDING to prime the pump again and put money into circulation as a means of bolstering up lagging business seems to most business men to be a futile and unnecessary measure. Up to now we have not heard of any cases where anything has been needed but official silence in the executive branch of government in Washington.

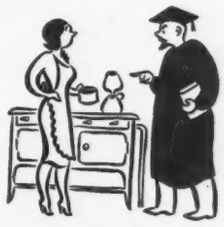
» THE RECENT APPOINTMENT of W. B. Duryee, former Secretary of Agriculture of New Jersey to be assistant to the president of Sheffield Farms, the New York subsidiary of National Dairy Products Corp., is an important development of the times. He is in charge of public relations for the company.

This form of public relations work is just as important as industrial relations work—perhaps more so, for a dairy company.

» WE SEE by the papers that J. L. Kraft has been elected a member of the Board of Directors of Stokely Bros. Co. Can't you just imagine Stokely frozen foods distributed nationally on Kraft Phenix refrigerated trucks?

» A HUGE FUND, alleged to be about $6,000,000, is to be collected by a voluntary tax of ½ cent per pound on green coffee imports. The purpose of the fund is to promote coffee consumption in the United States.

If the public ever learns what *good* coffee tastes like one suspects that a lot of purveyors of colored water, or its makings, will shut up shop.



To propagandize coffee successfully, however, we believe that a lot of the effort should be directed at the roasters themselves. and at the housewife to teach her how to brew decent coffee.

» AND SPEAKING OF COFFEE, we once saw a demonstration of the various flavors that came from different size-siftings of freshly ground, freshly roasted coffee. The fine dust leaves a lot to be desired. If one experience is any indication, the flavor of any coffee can be improved by its removal.

» AT A LITTLE INFORMAL five o'clock gathering at the British Embassy in Washington last month, we met two remarkable men, the British Minister for Overseas Trade and the British

Minister for Colonial Affairs. Their presence in Washington, though not heralded in the newspapers, seems to be intimately associated with the negotiations for the Reciprocal Trade Agreement with Britain.

At no time in our recollection have we ever met a man who so personifies the strength of the British Empire as does the Overseas Minister. He wanted to know how much longer our depression would last for, he said, it is beginning to affect British trade adversely. Britain feels that it is experiencing the trials of the traditional innocent bystander.

Selling Jobs for Production Men

ROUGHLY 10 PER CENT of all manufactured food is sold in bulk to other food manufacturers where it becomes a raw material for the next set of operations. Foods which come in this category are flour, sugar, salt, cocoa, chocolate coatings, butter, vegetable oils, shortenings, flavorings and the like. Such products are really "intermediates," as well as consumer foods.

The job of selling the "intermediate" in bulk is, however, decidedly different from the job of selling the food in consumer packages. Primarily the difference lies in the fact that the buyer of the "intermediate" is not a housewife but usually a thoroughly skilled food engineer. What he purchases must be fitted into the successful operation of a highly technical manufacturing plant. Salesmanship of an unusual order is required.

Many manufacturers have found that production heads from their own plants are often the best salesmen for such bulk products. And they always bring back useful ideas as to how to fit their own operations into the customers' needs. It is well known how buyers respond to salesmen who really know all about their products.

Everybody's Doing It

ANY FOOD MANUFACTURER who may have clung to a pious hope that the food business is holier than steel must feel very sad, now that NRLB has ordered H. J. Heinz Co. to *sign* a contract with Canning and Pickle Workers' Local No. 325. This union, if you must know, is a branch of the Amalgamated Meat Cutters and Butcher Workmen of North America, affiliated with A.F. of L. By the way, who says that the makers of pickles and meat have nothing in common? Certainly not the Amalgamated Meat Cutters and Butcher Workmen of North America.

Boosting Market Values

LARGER CREDITS against factory cost must constantly be sought from byproducts. Oftentimes the difference between profit and loss in a food factory depends on the returns from non-food items necessarily made as an incident to food processing. And right here is where the careless management often loses out—perhaps even goes broke.

It is just as important to do a good technical job in the recovery and preparation for sale of non-food byproducts as it is that the main food job be well done. Large meat packers learned this long ago. It was knowledge of this that put them so successfully into fertilizer, soap, and other non-food businesses.

Right now there are many divisions of food manufacture which are wastefully diverting their byproducts into the fertilizer business when these should be going to feed markets. Fishmeal makers, to refer to only one group, have discovered that it pays a good return to establish first-class technology as a basis for meal drying. It costs a very little more to make a high-grade meal suitable for feed markets than to prepare low-grade, burned, irregular types of meal which can be sold only to the fertilizer man and at significantly lower prices.

Just now when *every* item of cost must be studied, it is poor economy for the plant executive to decline to invest a bit for improvement of byproduct quality. Oftentimes such investment might become his real profit source. Also important are improvements in processes, which often cost little or nothing but pay big dividends.

Hors d'Oeuvres

• Oysters rank second only to calves liver as a source of iron and copper. They contain no lead, but are believed to be effective in producing it biologically.

• *Food-page headline: California Navels Active and Firmer. Maybe so, but they dassen't show 'em in the movies.—Must be some Young Sally Rands training for the San Francisco fair.*

• Here's an iron-clad fish story:—Mr. Fish of American Steel & Wire Co., Worcester, Mass., recently called Mr. Pike, of the Hanson-VanWinkle-Munning Co., Matawan, N. J., who called Mr. Herring of the Hanson-VanWinkle-Munning Co., Pittsburgh, who called Mr. Trout, of the Bethelehem Steel Co., Johnston, Pa., to make an appointment between Mr. Fish and Mr. Trout. The appointment was made, but we haven't heard yet who got hooked.

• *Sales of ice cream are a reliable barometer of business, says Prof. R. B. Stoltz, of Ohio State University's department of dairy technology. And Prof. Stoltz has charts to prove it. Right now, business is at the tip of the cone, so make ours pistachio.*

• When frankfurters emigrated to the United States from Germany in 1883, they were served in the nude. And the consumer was furnished a white cotton glove to keep from burning and soiling his fingers. But it took the roll to make the hot dog a national institution. Yes, progress makes perfect.

• *It was a quest of new foods which led Columbus to discover America, stories about Chris and Isabella notwithstanding.*

• Artificial wool, known as Lanital, has for some time been made from casein. Now a German professor says the albumen from fish makes an even better wool. Still on the subject of textiles, manufacturers use a gelatine process for making artificial silk. All this is according to *Textile World,* which suggests that women may eventually wear a sports dress made from oysters, lingerie from Borden's Grade A milk, hosiery from rocquefort cheese, a scarf from halibut, and a cloak from Jello. This would put Colby Chester in the cloak and suit business.

• *Sugar loaves, a modern and convenient form of an ancient food, were first made 500 years ago by an ingenious resident of Venice.*

• The action of the House of Representatives in killing a proposal to permit oleomargarine to be used in veterans' hospitals for table use has been hailed, by dairymen, as a signal victory for dairymen.

• *In connection with research work on the sterilization of drinking glasses by ultraviolet radiation, it was discovered that the average kiss deposits 100,000 bacteria, 40 per cent of which are pathogenic.—Don't say we didn't warn you.*

• Ten years ago a young scientist and his wife moved into an apartment with an obsolete electric refrigerator that emitted a musty odor. Practical scientist that he was, the husband devised a means of banishing that mustiness. The man was Dr. Robert F. James. The device that he put into the refrigerator was a special ultraviolet lamp, father of the Sterilamp now finding wide application in the food industries in killing mold and bacteria.

Flavor Sells Better Than Vitamins

CLAIMS regarding the vitamin content or other special characteristic of foodstuffs must be scrutinized more carefully now than heretofore. Federal Trade Commission regards statements of this sort with suspicion. It apparently intends to proceed against companies making such claims when there is any ground for doubt. It is not exactly a case of compelling a company to prove itself innocent, but it is uncomfortably close to that.

Probably the claims made about vitamins have been more spectacular with less warrant in fact than in respect to any other characteristic or constituent of food stuffs. This is very unfortunate. It has made it impossible for those who have a real scientific proof of their claims to get the deserved benefit for themselves and for the consuming public. Others with little or no basis in fact have destroyed the public's confidence. The purchasing public has been confused. Oftentimes, the buyer of goods has unwittingly taken the poorer qualities.

There are many other things besides vitamin content which ought to be promoted in the advertising of food stuffs. It is high time that flavor became more fashionable. There seems little doubt that the vast majority of foods are sufficiently nutritive to warrant their purchase. The refinements which Mrs. Housewife should seek to buy are, therefore, attractive appearance and pleasing flavor. Food processers will need to study these characteristics and press them more fully in future merchandising plans. In relatively few cases will vitamin propaganda be safe or useful for ordinary foods.

Dirty Floors—A Potential Hazard for Spoilage

BELGIAN EXPERIENCE in breweries indicates that some of our ideas about plant sanitation need to be revised and strengthened. Van Laer says that waste waters on the floor in which bacteria have started to grow are more dangerous as sources of infection than infected air. (*Petit Journal du Brasseur,* 45, 118, 1937). This is a confirmation of the recommendation of R. N. Bostock (FOOD INDUSTRIES, 9, 438, 1937) for the proper type of foundations for machinery in order to avoid these infections originating in unsanitary floors.

There was a time when the belief was accepted in the United States that material on the floor was only an esthetic offense but not a real hazard of sanitation. But, as time goes on, there appear more and more reasons why scrupulous cleanliness should always be maintained everywhere. And this is true whether it be in a brewery, a dairy, a packing house, a bakery or any other kind of food plant.

Those RFC Loans

PUMP PRIMING to relieve the business slump is again to be used. The RFC is to make loans to business—which is fine if business needs nothing more than ability to borrow money. It is said that RFC will even be a little liberal in its appraisal of borrowers.

Though the wisdom of resorting to pump priming is questionable, if it is to be made effective it must be done promptly. But one looks in vain for anything definite about the RFC's intentions. A selling program is wholly lacking. One learns of it only by the stories in the newspapers, by word of mouth, or from bankers who have also learned about it by hearsay.

Common business sense would dictate that an organization with a service to sell should put out some kind of signed statement the responsibility for which it could not duck. Whenever the government gets into business it should adopt business-like procedures and not trust to luck.

The trouble with word-of-mouth advertising of RFC loans to industry is that the story usually fails to report the catch in the matter. Local banks are expected to participate to the extent of 20 per cent.

Coincidence

WHEN EUGENE G. DRAPER left his post as Assistant Secretary of Commerce to become a member of the Federal Reserve Board, there occurred a simultaneous change of attitude of the Administration toward small business. It will be recalled that a digest of a large number of letters from small business men was forwarded to the President with the gratuitous public comment that plans for self-help were entirely lacking. Then came the promotion. Now the Administration discovers plenty of signs of self-reliance on the part of small business.

The New Revenue Law

TO TRY TO EXPLAIN the changes in the Federal Revenue Law of 1938, otherwise known as the Tax Bill, would require far more space than would be justifiable here. It will require arduous study by treasurers and tax departments as well as corporation lawyers.

The main thing to know is that it is retroactive to Jan. 1, 1938. That means it is highly important to get a copy of the law at once—if your job depends on tax matters—and later get the rulings, regulations and interpretations which the Treasury Department will make under the law.

In general, the new tax law is a great help. It could be better, but it could have been a whole lot worse. Yet we must never forget that the trend of taxation is up—never down. Our only hope is for the application of economic sense and the absence of political bias or attempts at social change via the tax route.

To Reduce Taxation

REGARDLESS of superficial indications, one should always remember that Mr. Roosevelt is working toward a planned economy. Though he may deny it, those who are in daily and weekly contact with him, realize that this is true. Knowing this to be the case, there can be no better news than the fact that Congress is beginning to assert its own independence.

If Congress will further demonstrate conclusively that it will make the laws, and not let the Cohen's or Corcoran's write them, business confidence that has been so sadly lacking will be restored. And such a restoration of confidence will unleash more private spending than the government can do.

Such New Deal congressmen and senators as we have met are usually pretty sound thinkers if they follow their own judgments. The danger comes when they blindly follow the dictates of the party leader. Witness this from a Democratic member of the House Ways and Means Committee which initiates all tax legislation. His card bears a Union label, stamping him as a representative of organized labor.

Said he, "There is no more important issue before the country than taxation. But the remedy is back home, not in Washington. You have got to keep the folks from coming here with their hands out. If they succeed in getting an appropriation, then it is this committee's job to raise the money. We cannot decide that the appropriation was unwise. We have got to get the money—somehow. It has already been apropriated."

That's the kind of thinking that will prevail if the President's grip on Congress can be wholly shaken off.

Frozen Food Problems
Discussed at Conference

MUCH INFORMATION of practical value to men engaged in the rapidly expanding frozen food industry was given out at the California Frozen Pack Conference, held in San Francisco, April 12.

D. G. Sorber, of the food research division, of the Department of Agriculture, described an experiment with Mount Washington variety asparagus cut in the early morning near Tracey, crated and loaded on trucks at 3 p.m., then iced and sent to Los Angeles. Before icing, the temperature ranged from 62 deg. at the bottom of the load to 80 deg. at the top. This range was from 41 to 49 deg. after icing. Two crates were placed on top of the load and were not iced. As a control, some of the lot was frozen immediately at Stockton and the balance was frozen the following day at Los Angeles, using both dry ice and sharp freezing at —20 deg. F.

These lots were all carefully sampled and no difference was found in taste, texture or quality except in the lot which had been transported without icing. This was definitely inferior in quality. The conclusion was that asparagus can be transported successfully if carefully iced for an overnight haul from the point of harvest to the freezer, but he recommended freezing as soon after harvesting as possible. A similar experience was reported with brussels sprouts and broccoli.

The most elaborate tests were with lima beans. These were blanched three minutes at 212 deg. and then frozen at —20 deg. It was found that the cooking time had a marked effect on the frozen product once it was taken out of cold storage for consumption. On the small varieties, beans cooked 4 to 6 minutes were satisfactory. Any cooking above 6 minutes rapidly resulted in a fading of the fresh product to a distinctly unattractive yellow color. Also, the keeping qualities of the cooked product showed a marked difference, depending upon the length of cooking.

The problem of packaging frozen food was discussed by William Kuster, consulting engineer. He pointed out that packaging depends upon several factors, principally distribution and storage. On the distribution side, he emphasized the necessity for an attractive package which is properly labeled to show the net weight and which permits satisfactory handling after the package has been purchased and removed from the distributor's storage.

While imperviousness to moisture is important, he emphasized that airtightness was even more important. The shape should be such as to permit easy filling and fast freezing. For this he recommended flat or shallow packages which would present as large a surface in relation to the volume as practicable. Most cases of freezer burn are due to poor packaging, that is, packages which are not airtight or in which the contents are too loose, he said. Proper humidity control, uniform temperature and the prevention of air circulation in the package itself are exceedingly important.

DR. W. V. CRUESS read a paper by James A. Berry, U.S. Frozen Pack Laboratory, Seattle, on the subject of microbiology of frozen packs. Dr. Berry discussed various tests conducted in the Seattle laboratory to determine the effect of time and temperature on microbial growths. He again emphasized the necessity for freezing the product as quickly as possible after harvesting. Otherwise, he recommended that the temperatures be kept as low as possible until the products could go into the freezer. He cited experiments with strawberries which showed that with fruit held 42 hours at 40 deg. F., the bacterial count was less than with fruit held at 90 deg. F. for 8 hours. Blanching, he stated, does not necessarily protect peas.

Peas held at 30 deg. F. showed no increase in microbial growth while those held at 70 deg. F. showed an increase of from 1,000,000 to 8,000,000 per gram in 24 hours. In the latter instance the product was spoiled. He claimed that sterilization is approached but never quite attained and that careful handling and proper temperature control are absolutely essential.

"Are frozen packed vegetables safe?" That is a question being asked by the public, Mr. Berry said. The answer to this is a very definite "Yes." Mr. Berry cited tests to show that botulinus cannot grow at 32 deg. or below. Frozen packed products, he stated, when once purchased by the consumer, will spoil if not used immediately, thus giving their own warning of unsuitability for human consumption. This spoilage consists of fermentation rather than toxic decomposition. This does not constitute a public health hazard.

Freezing rates as affected by air velocities and diameter were discussed by Prof. R. L. Perry, department of agricultural engineering, University of California. He pointed out that some of the laws of thermodynamics have been shown not to hold. Doubling the diameter of either the individual unit, say a pea or lima bean, required only three times as long to freeze instead of four times. Time of freezing was dependent upon air velocity, turbulence, diameter and temperature difference. In tunnel freezing, velocity is extremely important, he pointed out. Tests showed that doubling the air velocity increased the speed of freezing 1½ times; however, the power requirements on the blowers were increased eight times.

Results of recent tests on blanching were given by Dr. M. A. Joslyn, of the University of California. He declared that blanching is now an accepted practice and is not only necessary to inactivate enzymes but has been found beneficial in brightening the color of certain vegetables, due apparently to fixation of clorophyll.

Mr. Joslyn's complete paper will be published in a forthcoming issue of FOOD INDUSTRIES.

C. L. BEDFORD, University of California, discussed the character of enzymes and the temperatures and times necessary for their inactivation. He demonstrated simple qualitative tests for catalase and peroxidase enzyme reaction. It was his conclusion that time and temperature of blanching depends on the character of the vegetable, its maturity and the rate of inactivation of enzymes.

Summing up the meeting with a brief discussion on the future possibilities of the frozen food business, Dr. E. M. Chace, of the Department of Agriculture, declared that its ultimate success would depend upon quality plus. He urged the establishment of brands which would be accepted by the customers as labels of quality, just as are those products of the canners. The major problem today is to secure adequate distribution and to educate the retailer in proper handling of the industry's products.

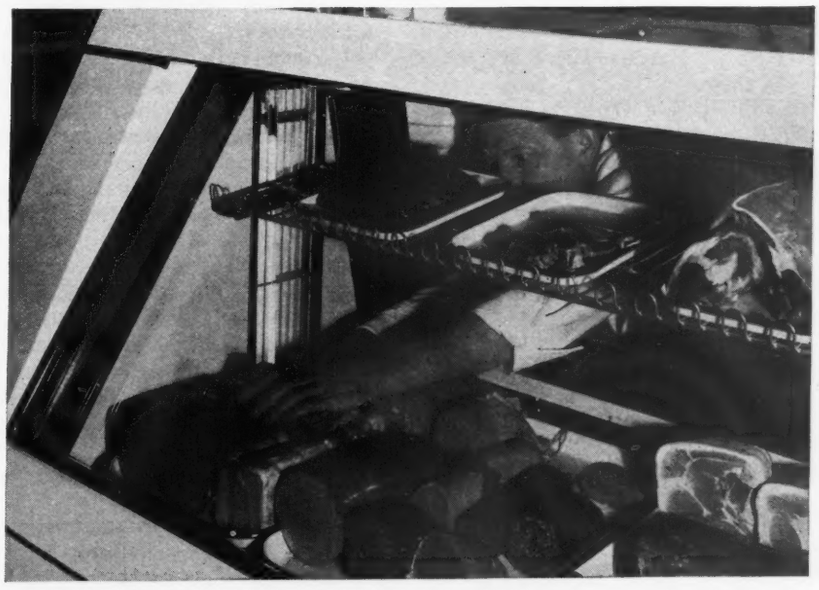
A NEW PROCESS *Goes to Work*

Ultraviolet method of killing mold and bacteria becomes a practical tool with widespread applications.

PART I

TWO YEARS AGO, FOOD INDUSTRIES reported the results of early experiments and the first industrial applications of a new method of killing mold and bacteria (page 295, June, 1936). At that time, the prediction was made that this new process would have wide application in the food field. Recent developments have borne out the accuracy of that prediction.

Involving the use of a selected band of ultraviolet radiation of greatest germicidal power, the process is called Rentschlerizing or the Rentschler-James process. This definite band of ultraviolet is generated by the Sterilamp, a development of Westinghouse Electric and Manufacturing Co., Bloomfield, N. J.



Refrigerated display case in which meats are protected from mold and bacteria by ultraviolet radiation. Lamp is installed vertically. A small fan circulates the air to keep entire case sterile and free of odors. Case is operated at 45 deg. F. and 90 per cent relative humidity.

▶These are momentous times in the food industries. An important new industry and a revolutionary new process are developing simultaneously. A statistical picture of the new industry, frozen foods, was presented in the last issue of FOOD INDUSTRIES. The current issue of FOOD INDUSTRIES, in the accompanying article, brings readers up to date on the uses to which the new process is being applied. Part II of the article to appear next month, will tell how to apply the process, giving quantitative information on the process, on the cost of applying it, and on savings effected with it. This process, called Rentschlerizing, is a practical tool for

All Food Manufacturers and Distributors

No longer in the experimental stage, this process is being used on a commercial scale in the meat, baking, beverage, dairy, preserving, fresh fruit and vegetable and frozen fruit industries. And its possibilities are being examined experimentally in the fish freezing and vegetable freezing industries. In addition to its actual applications, there are several likely uses of the process in the food field. Wherever it is desirable to kill mold or bacteria in a confined space where foods are processed, packaged, transported, stored or displayed, Rentschlerizing has possible application. And it can also be used to sterilize the surface of a food, to kill the mold and bacteria on containers, closures and equipment, and to sterilize air or water coming in contact with foods.

Enough applications have been made of the process that definite specifications can be given for its use. Information on the number of lamps needed, methods of installation, costs and savings will be given later. Meanwhile, take a look at the things that the food industries are doing with the Sterilamp, and see if these suggest to you some means of improving your own product or of reducing waste through spoilage from mold and bacteria.

In the meat industry, the Sterilamp is improving quality, reducing waste, saving labor and substantially reducing refrigeration costs. Take, for example, the case of Scherer & Co., Mahwah, N. J.

For about a year, Scherer has used the lamp in its holding cooler and display cases. The purpose is to keep free of mold and bacteria the cuts of beef, pork, lamb and fowl that hang in the cooler or lay in the case. Since

installing the lamps, no mold or slime appears in the cooler, and the display case always has a clean odor. And Scherer finds an increasing number of housewives asking for meat that has been kept in the display case with the "blue light." Scherer, in fact, has increased business 40 per cent since installing the lamps, though some part of this increase is due to wider distribution. With the aid of the Sterilamp, Scherer has been able to put his products into new sales channels—but that's another story to be told another time.

For fourteen months, Economy Stores, Boston, used the germicidal lamps in one store. Now, on the basis of results in this store, the company is installing the lamps in all of its "Stop and Shop" stores. There are about 15 of these.

Economy Stores reports an unusual experience with their ultraviolet lamps. On one occasion, their refrigeration compressor went out of commission on a week-end. As a result, the temperature in the meat cooler rose to 80 deg. There was several hundred dollars worth of meat in the cooler, but ultraviolet radiation saved it.

OF COURSE, Sterilamps are not used merely for protection in such emergencies. The primary reason for Economy Stores' buying the lamps is to realize the advantages already mentioned in connection with Scherer.

These, and other advantages, were described in FOOD INDUSTRIES, in June, 1936, but to mention a few highlights might not be amiss. Important among these is a reduction in refrigeration power costs amounting to as much as 25 per cent. This results from operating the cooler and the display case at temperatures up to 45 deg.

Perhaps the greatest advantage comes from the use of high humidity (90 per cent) in the cooler, which reduces the loss in weight of the meat due to evaporation of its water and natural juices. Tests have shown that beef stored in coolers at 34 deg. F. and a relative humidity of 60 per cent or less lost 2 per cent in weight in 24 hours and 3 per cent in 48 hours. Veal under the same conditions lost 4 and 5 per cent, respectively. At the higher temperature, the cooling coils need not be held below the freezing point where they freeze the moisture out of the air and lower the humidity in the box.

Another advantage of high temperature and humidity is the prevention of a darkened surface which must be trimmed before the meat is salable. It is estimated that mold, dehydration and trimmings account for a gross loss of 10 per cent to the average meat dealer.

In refrigerated display cases, where the temperature is kept at 45 deg. and the humidity is high, it has been found that prepared and chopped meats keep longer and better, that the display case has a sweeter odor, and that such a perishable item as cottage cheese does not become yellow and dried on the surface. Chicken loaf, kept four weeks in such a case, was still edible. Because of the preserving action of the lamp, dealers making up their own sausage are able to prepare it less frequently.

Meat and other products stored under these conditions do not reach the consumer handicapped by an incipient mold growth, and in consequence keep longer in household refrigerators.

Further, daily emptying and redressing of display cases is eliminated, and it is possible to dress the cases on Friday before the Saturday rush. And there is no need to "freshen" meat in the cooler by rinsing with bicarbonate of soda or by wiping off mold and slime.

In meat packing plants there are two departments in which there is particular need for killing mold and bacteria and in which there is possible, but as yet unmade, application of the Sterilamp. These are the bacon slicing and packaging and the sausage departments.

There is also an opportunity for meat packers to use the radiation in refrigerator cars carrying meat cross-country, thereby permitting the use of less refrigeration.

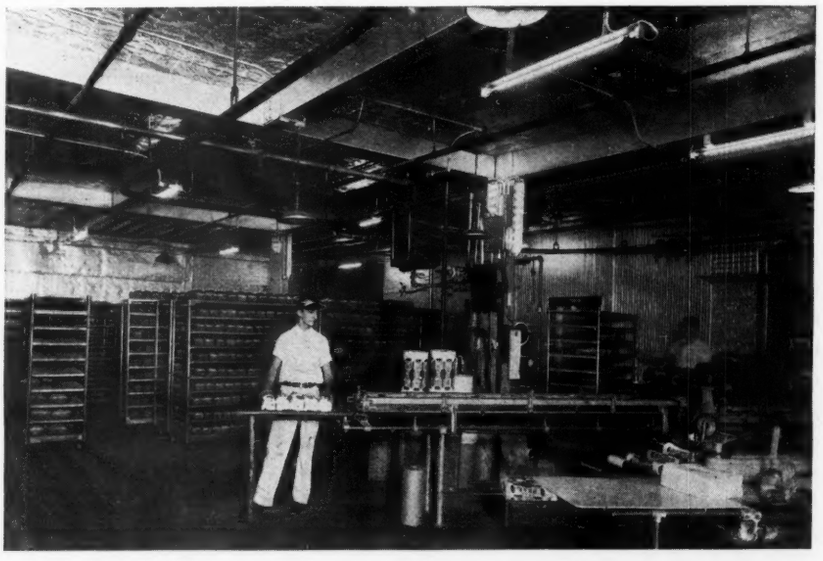
Bakers were among the first to realize the industrial possibilities of the mold and bacteria-killing ultraviolet irradiation. And the most extensive commercial use of the lamp is in the baking industry.

As reported in 1936 by FOOD INDUSTRIES, Kroger Grocery & Baking Co. effectively reduced spoilage of fruit cakes by mold to a mere 1 or 2 per cent. Since then, another large company has applied the radiation to fruit cakes to produce 400,000 lb. of that product without losing a single cake from mold. The year before the company lost $7,000 worth.

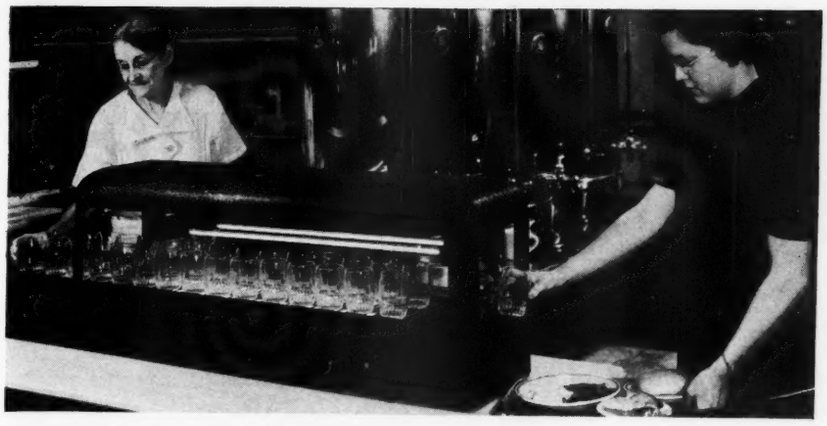
IN THIS latter application, the cakes are kept under the protecting rays of the lamp from the moment they leave the oven until they are packaged. Coming out of the oven, where they have been sterilized by heat, the cakes are placed on a conveyor which is irradiated by lamps mounted under a hood. This conveyor takes them to the cooling room. There, lamps on the ceiling and in the air inlet keep the room sterile. After cooling the fruit cakes are placed on trucks and wheeled into the packaging room, there to be wrapped under ultraviolet radiation in wrapping material rendered free of mold by the radiation. So there is no opportunity for the fruit cakes in this bakery to become contaminated with mold, either from the air or from the plant equipment with which they come in contact.

Ordinarily, the mold inside bakery products is killed in baking. But one bakery finds that it pays to kill the mold and bacteria on ingredients, such as raisins, which go into a health bread that it bakes. This is accomplished by the ultraviolet radiation.

But these are special applications. The real service of Sterilamp in the bakery involves its use more or less



This Haverhill, Mass., plant of 20th Century Bakery is kept free of mold by ceiling-mounted ultraviolet lamps. Result—product keeps in good condition longer in the store and in the consumer's breadbox.



The principle represented here in keeping drinking glasses sterile by ultraviolet radiation is employed in beverage plants to keep bottles sterile and in a preserving plant to keep glasses of jam and jelly free of mold and bacteria while they cool.

throughout the plant. The purpose is to keep plant and equipment free of mold, not to treat the product after it has become contaminated.

This process of killing mold begins in the dough room, where the warm, humid atmosphere is an ideal environment for the growth of mold and bacteria. Mold and bacteria formed at this point are carried by air currents to other parts of the bakery unless killed by Rentschlerizing.

Cooling rooms, slicing and wrapping rooms and conveyors are also radiated in the bakery. It is particularly important that vacuum coolers have a supply of sterile air. Otherwise, when the vacuum is broken and air admitted, the air penetrates the bread, carrying into the loaf air-borne mold and bacteria. The application of Sterilamps to vacuum coolers will be shown diagramatically in Part II of this article.

It is also important in the bakery to radiate the knives of bread slicing machines. This will prevent these knives from depositing mold spores between the slices and will improve the keeping quality of the product.

A bakery protected by the Rentschler-James process is enabled to deliver a mold and germ-free product which can be held longer both in the channels of distribution and after purchase by the consumer. It also makes possible a product of a higher initial moisture content that may permit less frequent deliveries.

IN RECENT MONTHS, the beverage industry has started to make capital of the Sterilamp, using it to kill mold and bacteria that otherwise would contaminate the bottled product and affect its flavor. Wayne County Produce Co., Brooklyn, N. Y., Rentschlerizes bottles after they have been sterilized by steam. The lamps are installed over the conveyor carrying the bottles to the filling machine and over the conveyor moving the filled bottles to the capper.

Dr. Pepper Bottling Co. has installed Sterilamps in its bottling plants to sterilize the compressed air used to force the beverage from the filling machines into the bottles. The lamps are installed in the air inlet of the air receiver. Dr. Pepper also sterilizes its bottle caps with the radiation.

It is an unusual task to which the Sterilamp has been assigned in the Brooklyn, N. Y., plant of Pepsi-Cola Co. Here, there is a problem of killing mold and bacteria inside a large, enclosed, metal syrup tank. Because of atmospheric conditions, condensation forms on the sides of this tank and dilutes the syrup around the edges and over the top. Dilution permits mold and bacteria to become active, so a battery of the Sterilamps is being installed inside the tank. These lamps will be mounted on a revolving hanger to give access to any of the lamps through a manhole in the top of the tank.

In the brewing industry, "cold pasteurization" of beer by the Rentschlerizing process is a possibility, though it is not now being done. And a very practical future application lines in the sterilizing of air in beer-cooling rooms.

In the dairy industry, three large cheese factories are employing Rentschlerizing to sterilize the inside of cheese cartons and to keep the filled packages sterile until they have been closed. After the cartons are set up and the foil liner inserted, they pass under the lamps on the conveyor leading to the filling machines. Then after filling, the packages are carried to the closing machine by a second conveyor radiated with the lamps.

As in the beverage plants, the dairy industry might use Sterilamps to treat the air used in conveying milk through the process, as well as the air in milk cooling rooms.

One of the dairy industry's oldest problems has been that of obtaining raw milk with a minimum of bacterial contamination. The Sterilamp is now helping to solve this problem. Cow barns have been equipped on several dairy farms. Bacterial counts have shown tremendous improvement in sanitary conditions.

Out on the West Coast, fruit and vegetable packers and shippers are Rentschlerizing the air and water used in precooling products prior to shipping. Where the precooling is done in cars by blowing refrigerated air over the cargo, this air is sterilized by passing it over the lamps.

NO MORE PRACTICAL, but perhaps more fascinating, is the use of the ultra-violet in precooling by water. Crates of the vegetables, after being packed for shipment, are passed on a traveling conveyor under a spray of refrigerated water. This water is recirculated and used over and over again, and to keep it sterile, it is passed under a bank of lamps on its way to the sprays. This application was tested by scientists at the University of California before it was put into operation.

Rentschlerizing is also being used in the packing of a fresh fruit—cherries. The fruit to be packed is dumped onto a radiated table, and the packing is done on this table, by hand.

A preserver, too, is employing the Rentschlerizing process. Here the purpose is to keep glasses of jams and jellies free of mold and bacteria while they are cooling and before they are capped. To do this, the filled containers are cooled under the ultraviolet lamps.

The frozen food industry has made one application of the Sterilamp and is experimenting with two others. A cold packer is radiating sliced fruit to be packed and also the syrup used in packing. A large company which quick freezes food is experimenting with the radiation of peas to kill bacteria before the product is frozen. Massachusetts Institute of Technology is experimenting with the use of ultraviolet on fish before freezing.

Part II of this article, to appear in the June issue of "Food Industries," will tell how to apply Rentschelerizing to various operations in food plants. Diagrams showing where to install the lamps will be given, together with information on how many are needed. There will also be information on cost of installing, maintaining and operating the lamps, with figures on savings.

A Method for Finding LOST MAN-HOURS

Unless the hours of labor that are paid for are usefully employed, there is loss. How the existence of such loss can be determined and corrected by a simple graphical method is told in this article

By H. A. MOON
New York, N. Y.

MAN-HOURS are lost when the activity of a worker is not accounted for during any period for which he is paid. To prevent such a loss, it is necessary to know how, when and where it occurs, and then take steps to eliminate it.

Fortunately, there is a simple and inexpensive method that enables any plant management to determine if such a loss exists; and, if it does, to see what moves can be made to remedy the trouble. This is a method of analysis called "Color Balance Analysis" which makes use of a series of charts giving, in color, a breakdown of existing conditions and a picture of the changes that can be made to improve these conditions. These charts can be made up for a single department, or for the plant as a whole. They do not take the place of cost accounting, or time and motion study. Rather, they are a first step to the effective use of such studies. Also, by means of these charts, the management can determine what benefits, if any, might follow the ensuing steps:

1. Rearrangement of the general manner of operation.
2. Rearrangement of those steps in any operating cycle that allow of change.
3. Shortening or lengthening the time allotted to any operation, that is, holding up or speeding up the production rate at certain hours.

Special stress is placed on the use of color in this method because, when properly used, it enables the management to take in the whole situation at a glance, which cannot be done so easily with black and white charts.

Necessary Materials and Use

The materials necessary to operate this method of work analysis include a 8x11 in. work board; cross-ruled paper; strips of colored, gummed paper; and pieces of colored cardboard. Where desired, colored pencils, crayons or water colors can be used in place of the strips of colored, gummed paper. The work board also has an accompanying guide or legend board, 6x11 in. in size.

The work board is made of fiber stock or similar material. As can be seen in Fig. 1, it is divided into squares, like a checker board. The squares are formed by stitching, so as to make a series of little pockets, open at the top so that a slip of colored cardboard can be inserted. The vertical rows of squares, reading from left to right, are designated as the ten hours in the work day, while the horizontal rows of squares, in order from top to bottom, represent (in this case) nine consecutive steps in the manufacturing operation that is being studied.

By changing the positions of the colored cardboard slips, called "riders," in accordance with the possible or desired changes in plant operations, it is possible to study these operations with relation to increased efficiency, increased production, lower costs, less power demand, and so on.

A.M. 7-8	A.M. 8-9	A.M. 9-10	A.M. 10-11	A.M. 11-12	P.M. 12-1	P.M. 1-2	P.M. 2-3	P.M. 3-4	P.M. 4-5

Fig. 1. Diagram of the work board used in finding lost man-hours. This board is a unit containing spaces for nine operations extending over ten hours. Operations are named in the guide board shown in Fig. 2.

Key to Colors Used	Description of Operation

Fig. 2. The guide board contains horizontal columns for each step in the manufacture of the product being studied and a vertical column for the color or shade assigned to each operative step.

Two boards can be laid side by side to represent two shifts, or three boards for three shifts. When it is necessary to show more than nine manufacturing steps, other boards can be placed above or below the first board. Thus 9, 18, 27 or more operations can be studied over a full 24-hour day by simply multiplying the number of boards used. Where the operations are so numerous as to make combination of boards unwieldly, the study is made by departments or sub-departments and the results brought together.

The guide or legend board is used to explain the meaning of the various colored riders. It has pockets similar to those of the work board, but longer, as shown in Fig. 2.

A colored rider is used to denote each operation, any color being selected that the user of the board may wish. This colored key to a given operation is inserted in a pocket in the guide board, in the column headed "Color Key," at the left of the board. In the long pocket at the right, opposite this colored key, a slip of cardboard describing the operation is inserted. Where the description must be lengthy, it is printed on pieces of paper of which are folded in accordian folds and then inserted in the pocket with the name of the operation showing. White riders are used to show totals at the top or bottom of any column. They are also used to mark the hours of any operation.

How the Charts Are Made

When the work board is set up, as described above, it is really a form of colored chart. It shows the existing conditions in the plant, as to what operations are taking place at any given hour, as soon as its user inserts riders of the appropriate colors shown on the guide board under the proper hour columns on the work board, and in the horizontal columns corresponding to the position of the colors on the guide board. This "work board chart" may be called a dynamic chart, because the riders can be moved as desired.

The next step is to fill out a labor questionnaire. This is in two sections and contains the following information, generally obtained by foremen or by the plant manager:

SECTION I—*Observation Questionnaire*

1. General flow of work.
2. General description of work, including:
   - (*a*) Time of happening.
   - (*b*) Place of happening.
   - (*c*) Manner of happening (speed of movement).

(*Turn to page 305*)

Color	No.	Operation	A.M. 7-8	A.M. 8-9	A.M. 9-10	A.M. 10-11	A.M. 11-12	P.M. 12-1	P.M. 1-2	P.M. 2-3	P.M. 3-4	P.M. 4-5
Purple	9	Separating	1	1	1	1	1	1	1	1	1	1
Orange	8	Churning	1	1	1	1	1	1	1	1	1	1
Black	7	Bottle washing	5	5	5	5	5	5	5	5	5	5
Gold	6	Case piling	1	1	1	1	1	1	1	1	1	1
Pink	5	Bottling milk	5	5	5	5	5	5	5	5	5	5
Green	4	Pasteurizing milk	1	1	1	1	1	1	1	1	1	1
Red	3	Cooling for storage	1	1	1	1	1	1	1	1	1	1
Yellow	2	Can washing	1	1	1	1	1	1	1	1	1	1
Blue	1	Receiving milk	2	2	2	2	2	2	2	2	2	2
			18	18	18	18	18	18	18	18	18	18

Guide board — Work board

Fig. 3. Chart No. 1 as described in the article, shows the original set-up in the plant used as an illustration of the method of finding lost man-hours.

Color	No.	Operation	A.M. 7-8	A.M. 8-9	A.M. 9-10	A.M. 10-11	A.M. 11-12	P.M. 12-1	P.M. 1-2	P.M. 2-3	P.M. 3-4	P.M. 4-5
Purple	9	Separating			1	1	1					
Orange	8	Churning		1	1	1	1					
Black	7	Bottle washing	5	5	5	5	5	5	5	5	5	5
Gold	6	Case piling			1	1	1	1	1	1	1	1
Pink	5	Bottling milk			5	5	5	5	5	5	5	5
Green	4	Pasteurizing milk		1	1	1	1	1	1	1	1	1
Red	3	Cooling for storage	1	1	1	1	1	1	1			
Yellow	2	Can washing	1	1	1	1	1	1	1			
Blue	1	Receiving milk	2	2	2	2	2	2	2			
			9	11	18	18	18	16	16	12	12	12

Guide board — Work board

Fig. 4. Chart No. 2 shows the first corrective step in the study of case described in the article.

Color	Men	Operation	A.M. 7-8	A.M. 8-9	A.M. 9-10	A.M. 10-11	A.M. 11-12	P.M. 12-1	P.M. 1-2	P.M. 2-3	P.M. 3-4	P.M. 4-5
Purple	1	Separating						1	1	1		
Orange	1	Churning						1	1	1	1	
Black	5	Bottle washing	5	5	5	5	5	5	5	5	5	5
Gold	1	Case piling			1	1	1	1	1	1	1	1
Pink	5	Bottling milk			5	5	5	5	5	5	5	5
Green	1	Pasteurizing milk		1	1	1	1	1	1	1	1	1
Red	1	Cooling for storage	1	1	1	1	1					
Yellow	1	Can washing	1	1	1	1	1					
Blue	2	Receiving milk	2	2	2	2	2					
			9	10	16	16	16	14	14	14	13	12

Guide board — Work board

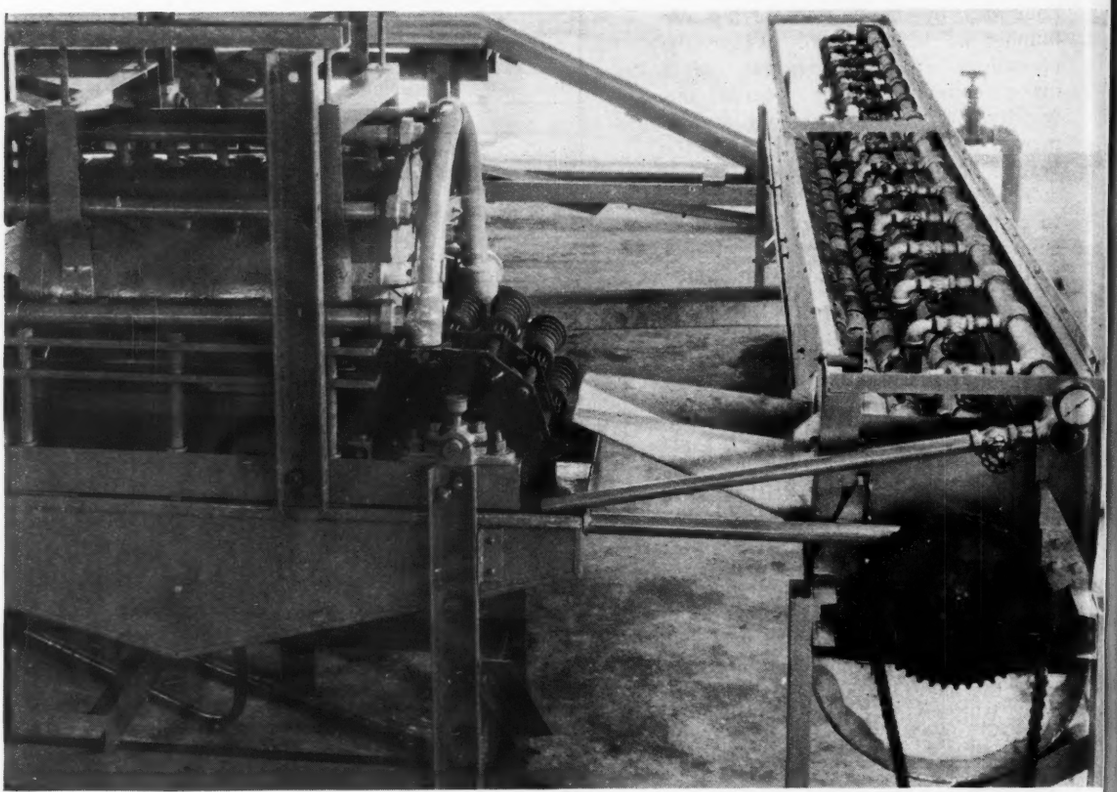
Fig. 5. Chart No. 3 shows the second corrective step in the study of the case described in the article.

Color	Men	Operation	A.M. 7-8	A.M. 8-9	A.M. 9-10	A.M. 10-11	A.M. 11-12	P.M. 12-1	P.M. 1-2	P.M. 2-3	P.M. 3-4	P.M. 4-5
Purple	1	Separating			1	1	1					
Orange	1	Churning						1	1	1	1	
Black	5	Bottle washing	5	5				5	5	5	5	5
Gold	1	Case piling			1	1	1	1	1	1	1	1
Pink	5	Bottling milk			5	5	5	5	5	5	5	5
Green	1	Pasteurizing milk		1	1	1	1	1	1	1	1	1
Red	1	Cooling for storage	1	1	1	1	1					
Yellow	1	Can washing	1	1	1	1	1					
Blue	2	Receiving milk	2	2	2	2	2					
			9	10	12	12	12	13	13	13	13	12

Guide board — Work board

Fig. 6. Chart No. 4 shows the final step in the case study. The payroll has been reduced from $90 to $65 per day and the lost man-hours from 38 to 11 per day.

Flame Peeling



Flame-peeling furnace and wash trough, showing conveyor which moves potatoes through flame zone, high pressure washing nozzles, and revolving pipes in trough bottom, with fabric hose sleeves in place.

New process, successful with potatoes, holds promise for processors of other vegetables.

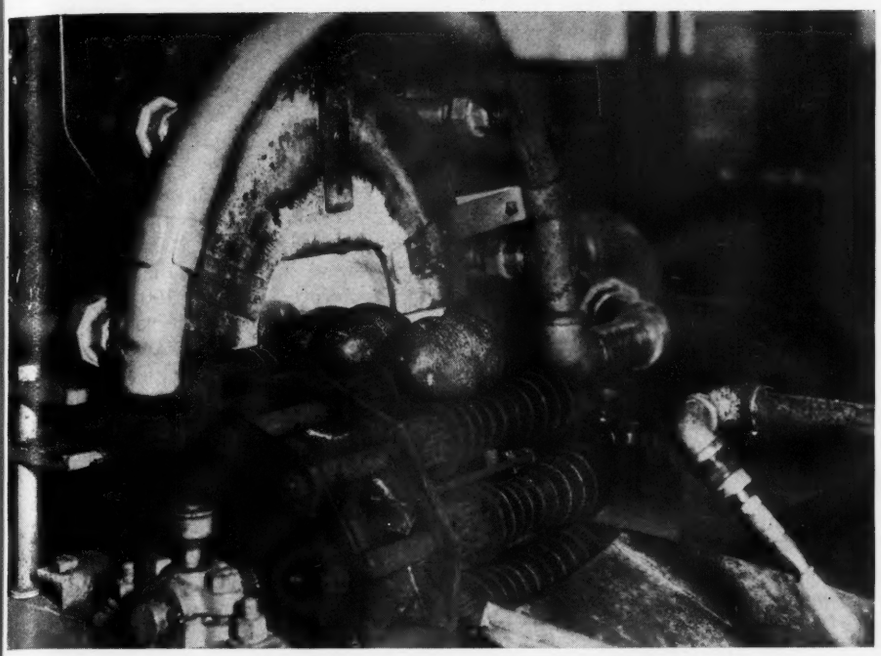
FOR MORE THAN TEN MONTHS, Sanitary Food Processing Company, Seattle, Wash., has been successfully operating and selling the product of a plant which peels potatoes by gas flame. The process, protected by U.S. Patents 1,948,877 and 1,948,884, granted in 1934, has undergone several years of intensive development. As a result of this, a plant with a capacity of 2,000 lb. of ready-to-cook potatoes per hour began supplying Seattle hotels and restaurants in 1937. It is expected that similar plants will soon be licensed to operate in other Far Western cities.

The plant in Seattle operates on a continuous basis, with four employees. The potatoes (U.S. Grade A, in this operation) are first thoroughly cleaned and then deposited on a loading table. From this they are fed, one at a time in proper time sequence, by a spacing conveyor onto the revolving corrugated rollers of the conveyor which carries them through the furnace.

The arch, or tunnel, of this furnace is 2 ft. long. This arch is formed of fire clay, 6 in. thick, and is enclosed by a metal jacket. There is a 4 in. space between the arch and the surface of the rollers, and the width of the arch is about 9 in. Forty tunnel-type gas burners are located in the top and sides of the arch. These are fed with porportioned gas and air mixture under pressure from a premixer, producing a temperature of about 1,800 deg. F. at the top of the arch and 1,700 deg. F. at the sides.

Seven seconds are required for the moving rollers to carry a potato through the length of this furnace arch. Pyrometer readings taken during this passage show that the surface of each potato reaches a temperature of about 1,750 deg. F. This has the effect of raising a great number of blisters on the thin outer skin of the potato. The blisters then break and the outer skin adheres to the potato in the form of small bran-like flakes.

As the potatoes emerge from the furnace, the rollers of the conveyor deliver them to a chute, down which they roll to the washer. This is a trough, 15 ft. in length. The bottom and sides of this trough are made up of six 2-in. pipes, geared so as to be revolved by a chain drive from a motor. Also, as can be seen from the illustration, each pipe has a number of short sleeves of fabric firehose fastened over it so as to give it a rough friction-surface. The revolutions of the pipes serve to move the



Potatoes with thoroughly blistered skins emerging from under the arch of the gas-heated peeling furnace.

potatoes forward along the trough.

Over this trough are located fifteen spray nozzles, supplied with water under 150 lb. pressure. The combined action of these high-pressure sprays and the rough fabric of the hose sleeves serves to completely remove the flakes of the outer skin from the potatoes, as they tumble over and over in their travel along the trough. Consequently when the potatoes reach the trough exit, except for the deepest eyes or indentions, peeling is completed.

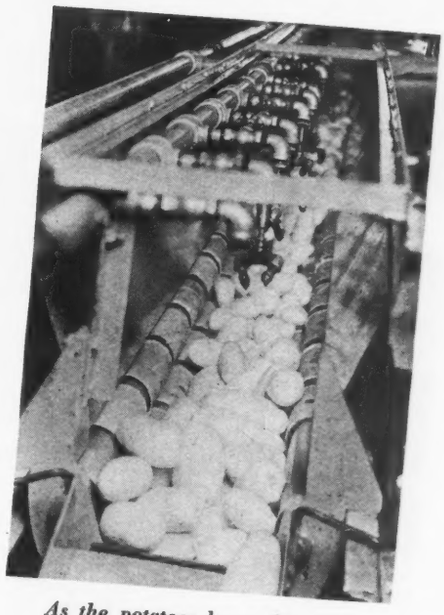
The next step in the process is to trim out the deep eyes, field gouges and other blemishes. As the potatoes leave the washer, a chute delivers them to a conveyor which carries them to the trimming table. At this point, the final trimming completes the peeling operation.

The conveyor on the trimming table delivers the completely peeled potatoes to an elevator. This delivers them to the top belt of the "conditioning box," in which two operations are carried out. Here the potatoes move back and forth on a series of six superimposed horizontal belts, dropping from one level to the next, and finally passing out through a chute at the bottom. While on the two upper belts, the potatoes are subjected to an air blast for about five minutes. This serves to remove the wash water and to dry the surface. Then, on the four lower belts, the potatoes are exposed to sulphur dioxide gas, which bleaches them and conditions them so that they will keep for a considerable period without discoloration.

In the next and final step, the potatoes pass, by elevator and belt conveyor, to the packing table. Here operators sort them into paperlined, returnable wooden boxes of 35 lb. capacity, ready for delivery.

In peeling potatoes by this method, one of the main advantages is the avoidance of waste. When peeled in the ordinary manner by hand, or with a mechanical peeler, both the inner and outer skins are removed together with part of the flesh of the potato. This loss may amount to as much as 20 to 30 per cent by weight. Also, much of the mineral and vitamin content of the potato is said to be concentrated in the inner layer of skin, so that it, too, is lost by usual peeling methods. As noted, flame peeling removes only the outer, cork-like thin skin, which is of little value from the nutritional aspect and constitutes but 1 per cent or less of the original weight.

While the temperature to which the potatoes are directly exposed is high, the period of exposure is so short that only the outer skin layer, and to some extent the outer surface of the layer immediately beneath are affected. The heating affects this latter layer to a depth of about one thirty-second of an inch, toughening it to some extent. This toughened coating serves to protect the potato beneath, preserving its flavor and moisture, and after the sulphur treatment this layer resists discoloring for several days. It is claimed that no flavor of sulphur remains after the treatment and that the amount of sulphur absorbed is less than 15 per cent of the amount permitted for dried fruits under the Federal food laws. Users state that the flavor of the potatoes is not impaired by the



As the potatoes leave the pressure washer all flakes of scorched outer skin have been removed and there only remains the removal of eyes and blemishes in order to complete the peeling operation.

▶***In line with present day trends toward more complete preparation of food before sale to the housewife or institution, and also as a step toward more economical preparation of vegetables before processing by food manufacturers, the method of peeling described in this article warrants attention by***

Canners
Potato Chip Makers
Produce Dealers
Self-Service Markets
Soup Manufacturers
Vegetable dehydrators
Vegetable freezers
Vegetable processors

treatment, but is actually improved.

In the operation of the peeling process, attention is given to economy. For example, the metal rollers which convey the potatoes beneath the furnace arch absorb considerable heat. So, on the return run, located beneath the furnace, these rollers are passed through a trough of cool water. This removes the heat and prevents the rollers from scoring the fresh unpeeled potatoes as these are fed onto the conveyor. Another economy is effected at the washing trough where the discharge water is led to a reservoir, screened and then used over again, thus requiring the addition of only a small amount of make-up water.

Cost factors involved in the process are low, in view of the economies of carload buying and the elimination of waste. Sanitary Food Processing Co. asserts that the investment in a plant of the type described, about $5,000, is easily justified if marketed problems are properly approached.

Seattle gas is rated at 500 B.t.u. per cu.ft. At this rating, an average hourly output of 2,100 lb. requires 1,300 cu.ft. of gas per hour. This is from 50 to 60 cu.ft. per 100 lb. of potatoes, varying somewhat with potato size.

Motors required to operate the various units total less than 40 hp., including the 30 hp. motor which drives the centrifugal pump for producing the 150-lb. pressure wash water.

Water requirements are 500 gal. per hour. Cost of sulphur used is negligible. Exclusive of labor and overhead, operating costs at the Seattle plant are about $1 per ton.

THE FOLLOWING COST COMPARISON has been made:

Restaurants pay $1.50 per 100 lb. for unpeeled potatoes. Peeling loss is 25 per cent. Peeling cost is 75 cents per 100 lb. Net product is 75 lb. of peeled potatoes at a cost of $2.25, or $3 per 100 lb.

With flame peeling, potatoes are purchased in carload lots, so that the price per 100 lb. is lower, say $1.25. Machine cost is $1 per ton. Labor delivery, rent and general overhead, is not over $7 per ton. Operation cost is thus 40 cents per 100 lb. Losses are 1 per cent for peeling and 4 per cent for trimming, leaving 95 lb. net, costing the operator $1.65 delivered, or $1.74 per 100 lb.

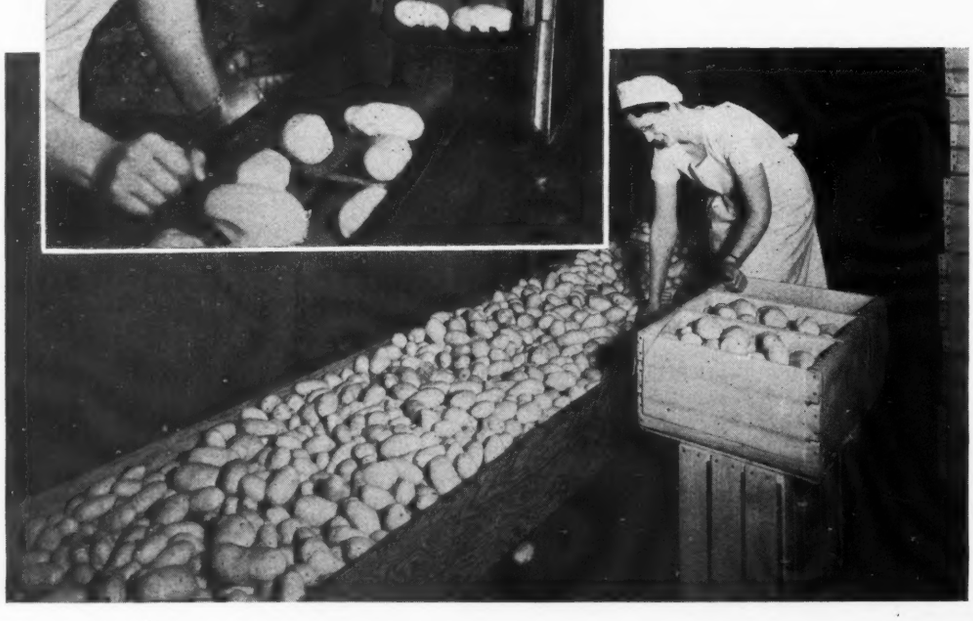
Differential in favor of flame peeling is therefore $1.26 per 100 lb.

It is pointed out by the operators that flame peeled potatoes have several definite consumer appeals. The heat-toughened surface is not noticeable in the mashed product, either by discoloration, flavor-change or lumpiness. When cooking is by the pan roasting method, the outer surface is brushed with butter and cooks to a crisp shell. After boiling or steaming, if left whole, the potatoes do not discolor, nor do they discolor when used by delicatessens in making salad, or by soup manufacturers or canners of other foods containing potatoes.

It is possible to carry on an additional process within the plant already described, whenever sufficient potential volume develops. This is the preparation of ready-mashed potatoes from the smaller and cheaper grades.

So far this has only been done on a trial basis, but it has been determined that the small potatoes are particularly suitable for this purpose, having a good flavor. Also, such small potatoes closely resemble new potatoes, when peeled, and therefore are highly suitable for use by the restaurants in out-of-season preparation of featured seasonal dishes, such as Irish spring lamb stew, New England boiled dinner, or parsley potatoes.

This operator removes eyes and blemishes from the peeled potatoes, which then are delivered by a belt elevator to the "conditioning box" for drying and sulphuring.



After conditioning is completed, the finished flame-peeled potatoes are packed in paper-lined returnable boxes of 35 lb. capacity, for delivery to hotels, restaurants and other consumers.

Are INDUSTRIAL WASTES *Liabilities?*

An Editorial by

F. W. MOHLMAN

Editor, Sewage Works Journal

Reprinted from Sewage Works Journal, Vol. X, No. 1, January, 1938.

CONSERVATION is the slogan of the day, whether it be of natural or industrial resources. Wanton waste is abhorrent to an enlightened civilization. If we have the ability to solve the intricate problems of production and improvement of industrial products, we should also have the ability to solve the problem of satisfactory disposal of wastes produced by such processes. It is frequently said by manufacturers that no methods of treatment are known for their wastes. As a matter of fact, there are probably technical means for treating all industrial wastes, and the only thing that stands in the way of a Utopia of wasteless industry is the question of cost. Every problem involves a balance of cost of disposal against the benefits obtained, and there is no sense or justice in demands for elimination of wastes from our streams and sewage treatment works, regardless of cost.

Fortunately, there are a few outstanding examples of industries which have profited by recovery of materials, once considered wastes, which now have commercial value. These few industries should be an incentive to the others, which still discharge residues of manufactured products to the sewers, to consider carefully the possibilities of recovering more of their raw materials. This consideration should not stop with a mere perfunctory analysis of costs and values, but research programs should be outlined, consistent and continuous studies should be undertaken in properly equipped chemical laboratories, and small-scale testing stations should be operated. Only in this way can industry convince the sanitary authorities that it appreciates the seriousness of the pollution of streams and lakes by industrial wastes.

When one considers the magnitude and complexity of the industrial waste problem, the few demonstrations of profitable recoveries of waste materials do not in truth give promise of widespread or prompt alleviation of the problem by profitable recovery of materials, but at least they prove that a careful study of the problem, as well as the expenditure of substantial sums of money has been well worthwhile for some plants. The three outstanding examples of successful recoveries of industrial wastes are the Corn Products Refining Company, located in the Sanitary District of Chicago, the Hiram Walker Distillery at Peoria, Illinois, and the U.S. Industrial Alcohol Company at Baltimore. It is significant that all three industries use similar raw materials, primarily carbohydrates such as molasses, starch, corn, rye and other cereals. Recovered products are stock feeds which always find a ready, although fluctuating, market. It seems logical to assume that in other types of industries, if the products are salable, the solids recovered or kept out of the wastes should also be salable, even though at a reduced value. However, in many processes the materials in the wastes are different from the salable products, because of chemical decompositions or syntheses used in the process.

A brief consideration of the progress in other industries of waste recovery indicates that recovery of more or less of the wasted materials may be possible, but finally some process of treatment allied to sewage treatment, or evaporation, may be required.

In the brewing industry, spent grains are generally recovered by dewatering in expellers, and steam drying. The expeller discharges a highly concentrated and putrescible liquor which adds considerably to the population equivalent of the wastes. Likewise, waste yeast and wort residues add to the organic load. A concerted study of improved methods of recovery would show results.

Yeast, vinegar and distillery wastes are a tremendous problem. The question of concentration of solids in the wastes now seems to be the dividing line between profitable and unprofitable recovery—but this question is the crux of all industrial waste problems. The fermentation industry is making a commendable effort to find out how much can be recovered within the factory. Jensen, in Denmark, has developed processes for the treatment of these wastes, and the Standard Brands Corporation in this country has been carrying on intensive research for several years on the treatment of yeast wastes. Commercial Solvents Corporation has also studied the problem, and the Hiram Walker plant has installed and is operating equipment which is claimed to recover practically all of the organic solids. Other distilleries are making some effort toward a study of the problem.

The great meat packing industry produces probably the largest volume of the most putrescible waste in American industry, and for decades this waste has defiled streams and overloaded sewage treatment works, yet there has been no concerted effort to study the problem. Individual packers have made laboratory studies, but the industry's research center, the American Institute of Meat Packers, has done nothing. The once-vaunted boast that everything was recovered but the squeal never was true; the sewers carried away the evidence of other losses. However, some effort has been made by individual packers to alleviate this problem, notably at the Hormel plant in Austin, Minnesota. Unfortunately, the sludge proved to be toxic as a stock feed and too greasy for a fertilizer, to confirm the earlier hopes of a valuable byproduct, but this was the best effort that has been made by a packer to recover more of his waste materials.

Other organic wastes, from canneries, wineries, and beet sugar works, are widespread and the losses are staggering, but in this field there are so many small plants that attention should first be directed to the larger ones. For isolated seasonal plants, Warrick has reported progress in treatment, but the brief season in most canning operations makes for inefficiency in recovery of solids in the factory. The tremendous losses of tomato solids from the large tomato canneries are astounding. Surely this is a fertile field for the best efforts of research chemists.

Dairy wastes are ubiquitous, and consequently have been subject to

(*Turn to page 310*)

UNREACHED MARKETS for *Baked Goods*

Where that $500,000,000 potential volume is to be found

By EUGENE SZEPESI
Director of Economic and Business Research, Miller, Franklin & Company, Inc., New York, N. Y.

★

If You are not a Baker—

How much of a given food can the market take? What is the potential consumption? How much can or will people spend for a certain food?

Questions like these are the concern of management of every kind of food company. Mr. Szepesi, who has had much experience in computing the potential sales volume for many commodities, has chosen Bread and Cake as an example of what can be done to ascertain the possibilities of the future.

Whether you are a baker or a manufacturer of any other foods, this series of articles which indicates the existence of an unreached sales volume of $500,000,000 annually for baked goods is important to you. If you are a baker it shows where and how to increase the volume. If you are not a baker it shows a vulnerable spot.

If you agree or disagree with Mr. Szepesi's conclusions, your comments will be welcome—THE EDITORS.

★

Part II

(*Continued from April* FOOD INDUSTRIES)

A HUGE VOLUME of potential business is still available to producers of baked goods, as was brought out in Part I of this discussion, published in April FOOD INDUSTRIES. It is computed to be about $500,000,000. The next step is to determine where this unreached sales volume is located. Reference to Fig. 3 will reveal the calculated amount of unreached retail sales which the baking industry failed to get.

The figures are presented in three ways: (1) dollar value of the unreached potential volume; (2) a bar-chart to show the relative magnitude of the unreached potential arranged by states; (3) a table of figures showing the size of the unreached potential market in terms of percentage of bakery products that were actually sold in 1936. These values differ with the density, character, and the purchasing potentials of the population, but for each state they are imposing enough to urge the bakers to coordinate their activities in order to get a greater share of the nation's income.

This half-billion dollar promise for expansion, instead of leading to a

State	Sales: Bread: Per Cent	Sales: Cakes: Per Cent	Bread	Cake
Massachusetts	61	39		
Colorado	62	38		
Rhode Island	63	37		
New York	63	37		
Illinois	63	37		
Michigan	64	36		
Tennessee	64	36		
Georgia	64	36		
Maryland	65	35		
Pennsylvania	67	33		
Missouri	67	33		
California	67	33		
Washington	67	33		
New Jersey	68	32		
Ohio	68	32		
Nebraska	68	32		
Maine	69	31		
Utah	69	31		
Minnesota	70	30		
Arkansas	70	30		
Connecticut	71	29		
Kentucky	71	29		
Wisconsin	71	29		
Virginia	72	28		
Oregon	72	28		
District of Columbia	73	27		
Texas	73	27		
New Mexico	73	27		
Louisiana	74	26		
North Carolina	76	24		
Florida	76	24		
Oklahoma	76	24		
South Carolina	77	23		
Kansas	77	23		
New Hampshire	78	22		
Indiana	78	22		
Idaho	78	22		
Vermont	79	21		
Nevada	79	21		
Delaware	80	20		
South Dakota	81	19		
West Virginia	82	18		
Iowa	83	17		
Arizona	83	17		
Wyoming	83	17		
Alabama	84	16		
North Dakota	84	16		
Montana	85	15		
Mississippi	85	15		

Fig. 4 Bread or Cake?
This chart shows how the people of each state apportion their purchases between bread and cake.

State	Value in Dollars	Per Cent of actually Purchased Bakery Products
Illinois	33,700,000	33.5
Pennsylvania	31,700,000	21.5
California	30,900,000	40.8
Ohio	29,000,000	34.2
New York	28,870,000	13.0
New Jersey	27,400,000	48.5
Texas	25,800,000	90.0
Indiana	21,500,000	70.0
Minnesota	19,700,000	150.5
Kentucky	19,150,000	182.0
Iowa	16,000,000	96.0
Michigan	16,000,000	26.0
Wisconsin	15,800,000	66.6
Kansas	14,300,000	139.0
North Carolina	14,250,000	178.0
Missouri	13,650,000	33.0
Alabama	13,200,000	184.0
Florida	12,550,000	112.0
West Virginia	11,400,000	102.0
Georgia	10,950,000	91.5
Virginia	10,650,000	93.5
Oklahoma	10,650,000	98.0
Tennessee	10,500,000	69.(
Washington	8,900,000	55.3
Lousiana	8,440,000	82.0
Massachusetts	8,140,000	13.2
South Carolina	7,720,000	178.0
Colorado	7,340,000	86.0
Arkansas	6,870,000	127.0
Mississippi	6,770,000	203.0
Connecticut	6,550,000	31.7
Oregon	5,950,000	64.0
Nebraska	5,840,000	56.4
Maine	4,220,000	58.0
South Dakota	3,390,000	128.5
North Dakota	3,330,000	150.0
New Hampshire	3,250,000	74.4
Arizona	3,190,000	141.0
Idaho	3,150,000	181.0
New Mexico	3,140,000	447.0
Utah	3,120,000	73.0
Montana	2,460,000	71.0
Vermont	1,970,000	76.4
Wyoming	1,820,000	180.0
Delaware	1,720,000	70.0
Nevada	1,000,000	172.5
Total for United States	545,000,000	

The States of Maryland, Rhode Island and the District of Columbia have been omitted, because these potentials could not be verified without further analysis

Fig. 3 Available purchasing power captured by other foods

Retail value of foods, home-baked and other foods, that displaced baker's bread or cake. (Farm families are not included).

Deducting the home-baking of the lowest income level, where possibly it may be a necessity, the commercial value of home-baking of the urban and non-farm rural population is estimated at about $400,000,000 annually. This certainly indicates a large enough demand for quality—one which should not be ignored by the industry. Nor is there an economic reason why all baked goods should be kept at the lowest price level. Our living standards have long ago passed the point where bread represents the one staple food of the population. Baked products make up less than 15 per cent of the food bill of the nation, and less than 5 per cent of all expenditures. Hence it has passed from being the staff of life into the position of one of the staples.

If the baking industry produces a better quality and gives greater satisfaction to the consumer at a higher unit cost, the industry will only follow the natural trend of economic evolution. A comparison of the relation of the sales of the "glorified" bakery products, summarized as cakes, to the sales of bread products, as demonstrated in Figs. 4 and 5, will bear out the accuracy of this conclusion.

From an economic approach, cake is only a more flavorsome bread prod-

(*Turn to page 308*)

compliant attitude toward the contracting flour consumption, should be an argument strong enough to induce the industry to plan in *terms of potential business and not in the terms of the past sales,* and to analyze earnestly the basic reasons why such a great potential purchasing power continues to escape their industry.

The bakeries will find that their future does not lie in the bolstering of flour consumption, but in the creation of quality products for such potential customers who do not want to eat more, but who have the means to consume and pay for better goods.

In the State of New York, for instance, a fair quota for baked food products, per family, is $83 per year, while the actual energy-producing baked food requirements are only $60 per year. This difference need not be permitted to flow away from the industry, but should be recaptured through the increased quality of the product.

Fig. 5
Summary Analysis of Cake Sales of the United States

Based on Consumption of Urban and Rural Non-Farm Population

Computed on the Combined Factors of 1929 to 1935.

	Cake Sales Value Between 40 and 30 Per Cent Of Total Sales	Cake Sales Value Between 30 and 20 Per Cent Of Total Sales	Cake Sales Value Less Than 20 Per Cent Of Total Sales
	California Colorado Georgia Illinois Maryland Massachusetts Maine Michigan Missouri Nebraska New Jersey New York Ohio Pennsylvania Rhode Island Tennessee Utah Washington	Arkansas Connecticut Dist. of Col. Florida Idaho Indiana Kansas Kentucky Louisiana Minnesota Nevada New Hampshire New Mexico North Carolina Oklahoma Oregon South Carolina Texas Vermont Virginia Wisconsin	Alabama Arizona Delaware Iowa Mississippi Montana North Dakota South Dakota West Virginia Wyoming
Average Per Cent of Cake Sales Value for Group	34.3	25.6	16.9
Per Cent of the Total United States Bakery Product Sales for Group	78.	18.	4.
Per Cent of Total United States Cake Sales Value for Group	83.	15.	2.
Per Cent of Total United States Sale Value of Cake for Group, if the Corresponding Purchases for Bread are Deducted	17.3	3.	0.5

Engineered for ECONOMY

A plant with a dozen advanced ideas in air conditioning, power generation and automatic control. Equipment will pay for itself in three years.

By JACK GUTFREUND,
President, Gutfreund's Olympia Market, Inc.
New York, N. Y.

EQUIPMENT that pays for itself in three years through savings would be most welcome in any plant. When that equipment at the same time improves the quality of the product, reduces waste and provides ideal conditions in plant and salesroom, it becomes doubly valuable. And these are the things the air-conditioning installation and diesel power plant are doing in the new meat-cutting plant of Gutfreund's Olympia Market, Inc., New York.

A pioneer in the cut-meat business, Gutfreund originally entered that branch of the meat industry in 1892. The business has expanded until the company has outlets from coast to coast. It delivers over a radius of 150 miles from New York with its own trucks, of which it operates ten. Expansion of business forced the company to build its new plant.

The new building is a model of food-plant construction, being of brick, concrete and steel, with gleaming white tile walls, impervious concrete floors, and heavy corkboard insulation in the walls, floor and roof. It houses two large coolers, a truck loading platform, offices, engine room, storage room, and locker roms. To facilitate circulation of conditioned air, the coolers are built with 12-ft. ceilings, giving about 4 ft. of space above the meat rails.

But of more interest are the air-conditioning installation and the power plant. Both involve principles of engineering with which every food-plant manager should be familiar. The air-conditioning plant embodies a new method of humidifying air and other advanced principles applicable in a great many food plants. The power plant, too, has wide application, being exceedingly efficient where there is a relatively large refrigeration or electric-power load and a nominal heat load. Both the air-conditioning plant and power plant are equipped with systems of automatic control which illustrate how a process can be made to perform with a high degree of accuracy under widely varying conditions without attention from an overseer.

To supply air conditioned to a relative humidity of 87 per cent at 34 deg. F., two Carrier cold diffusers were installed in the plant. One of the diffusers serves the downstairs cooler, which is 45x80 ft., and the other the upstairs cooler, measuring 45x70 ft. Each diffuser is located at one side of the cooler and distributes conditioned air through a large ceiling duct, which extends crosswise of the room at the center and which has four outlets on each side.

To avoid defrosting the coils, an operation which requires time, is messy, and permits the temperature in the cooler to rise, the brine-spray type of cold diffuser is used. In this, salt-water is sprayed over direct-expansion ammonia coils, and the air being conditioned is drawn through the brine spray by a motor-driven fan. The diffuser is also equipped with a heating coil through which hot gas from the ammonia compressor is automatically bypassed in event the temperature of the cooler falls below 34 deg. This temporarily converts the unit into a heater. One might wonder if heat is ever necessary in a cooler. But there are times when it is needed. There is the case, for example, of the meat distributor, who, finding a bargain in frozen beef, loaded his cooler up with it. Soon afterward all the other meat in the cooler was frozen. The temperature of the beef had been 10 deg. when it was put into the cooler.

The new humidifying system (Fig. 1) used in the Gutfreund plant is quite simple, positive in action, automatic in control and ingenious in design. Basically, it consists of small spray nozzles supplied with water at 125 lb. pressure through a $\frac{3}{8}$-in. brass pipe,

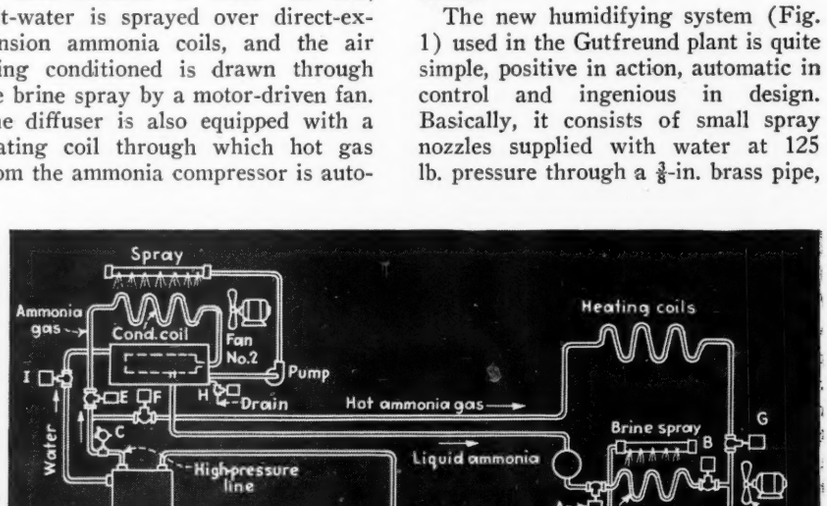
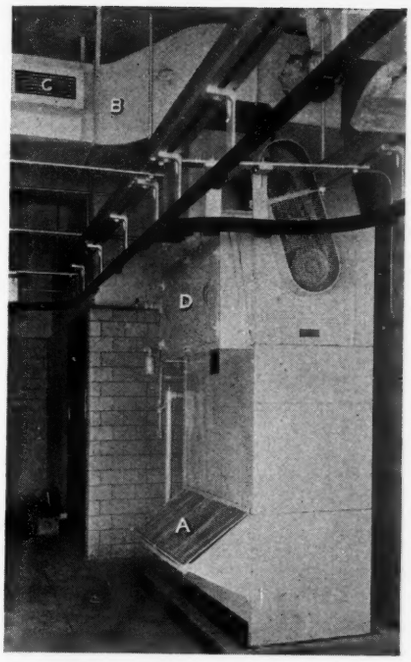


Fig. 2—Schematic diagram of refrigeration system, showing automatic controls. When temperature in cooler falls below 34 deg., valves A and B are closed by a thermostat to cut out the ammonia coil, and fan 1 is stopped. When pressure on high side of compressor becomes excessive, pressure switch C disengages magnetic clutch K to stop the compressor, also stopping fan in condenser. When the compressor suction becomes too low, pressure switch D in the suction line engages the clutch to start the compressor, also starting fan in condenser. When temperature in cooler falls below 34 deg., valves E, F, G are operated by a thermostat to bypass the hot compressor gas through the heating coil of the cold diffuser. When outdoor temperature falls below 40 deg., valve I cuts off supply of water to evaporate condenser, which is on roof, and valve H opens to drain the condenser reservoir.



Cold diffuser which supplies refrigerated air to cooler. Air is taken in at A, drawn upward through a refrigerated spray of brine and discharged into the main duct B, which extends across the room. Four outlets like C on each side of the main duct distribute the air. Inside of D is a heating coil that operates automatically if the temperature falls below 34 deg. F.

a motor-driven centrifugal pump delivering the water to the sprays. Since the air in the cold diffuser duct is at 26 deg. F., the humidifying moisture cannot be sprayed directly into it or snow would be produced. So a secondary air duct was built below the main duct at each of the main-duct outlets. A stream of air is induced to flow through the secondary duct by ejector action. That is to say, as the stream of air discharging from the main-duct outlet flows over the outlet of the secondary duct, it pulls air out of the secondary duct. Since the air flowing through the secondary duct comes from the cooler and not directly from the cold diffuser, it is at a temperature of 34 deg., and water can be sprayed into it without freezing.

To increase the atomization of the water used to humidify the air, it is sprayed against a target, or metal plate, located in the secondary duct a few inches from the spray nozzle and in the stream of circulating air.

Automatic control of the humidity in each of the coolers is effected by a humidistat. When the humidity drops below 87 per cent, this instrument, acting through a relay, opens a solenoid valve in the spray line and also starts the motor which drives the pump supplying water to the sprays. And if the cold-diffuser fan is not operating, the humidistat starts it to provide circulation of air through the ducts.

The spray water not absorbed by the air drains out of the secondary duct into a pan beneath, flows back to a reservoir and is recirculated through the sprays. None is wasted, and only about 100 lb. of water per hour is consumed in humidifying each room.

A thermostat in each room automatically controls the room temperature. This instrument operates (through a relay) a solenoid valve in the line supplying liquid ammonia to the cold-diffuser cooling coil and another solenoid valve in the suction line taking ammonia gas from the coil. So when the temperature in the room falls below 34 deg., these valves are automatically closed to shut off the supply of ammonia to the coil. When the temperature rises, they are opened (see Fig. 2).

Operation of the ammonia compressors is also automatic. Each compressor is driven through a magnetic clutch which is actuated by a high-pressure switch on the discharge side of the compressor and by a low-pressure switch on the suction side. If the suction pressure becomes too low, which happens when additional refrigeration is needed, the low-pressure switch engages the clutch to start the compressor. When the compressor has built up a sufficiently high pressure on the discharge side, the other switch disengages the clutch and the compressor stops. The controls are pressure - actuated, mercury - in - glass electric switches.

Control of the heating coil in the cold diffuser is by thermostat, this operating solenoid valves to bypass hot ammonia gas from the compressor through the coil, instead of permitting it to follow its normal route to the condenser on the roof. The thermostat at the same time starts the fan motor of the cold diffuser and opens a damper to permit air to pass in over the heating coil and mix with the main air stream passing through the diffuser.

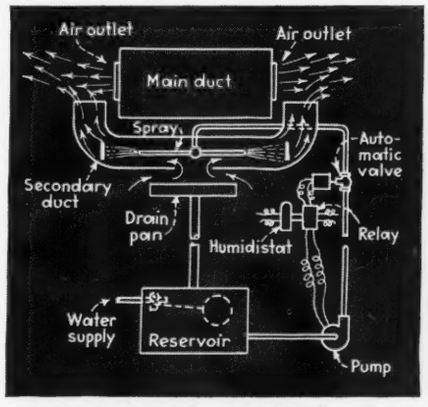


Fig. 1—Schematic diagram of new Carrier humidifying system. Water is sprayed into the air as it is circulated through a secondary duct suspended below the main air duct. Automatic control turns the spray on and off to regulate the humidity at 87 per cent.

Another automatic control aiding in the successful operation of the air conditioning system is a float valve that maintains a constant level of ammonia in the liquid-ammonia receiver, thereby insuring complete flooding of the coils in the cold diffuser. This is necessary for maximum efficiency in refrigeration.

For sake of economy, the water circulated through the ammonia compressor jacket is used also in the evaporative condenser that condenses the ammonia gas. Located on the roof, this condenser consists of a coil through which the ammonia gas passes, a spray which wets the coil, a fan to circulate air over the coil and a pump to recirculate the unevaporated spray water. Highly efficient, this condenser cuts refrigeration power costs by as much as 25 per cent over an ordinary condenser because it lowers the condensing temperature. The unit consumes only about 1 gal. of water per hour per ton of refrigeration, whereas on straight condensing, 2 gal. per minute per ton would be used. The evaporative condenser is a small, compact unit which does the work of a large cooling tower, does it more efficiently and does it with much less power consumption.

Another step in the cause of economy is the location of the ammonia receiver of the evaporative condenser in the reservoir which collects the spray water from the condenser. This provides supercooling of the ammonia at no extra cost.

Were it not for automatic control, use of this evaporative condenser would require manual operation to prevent the water in it from freezing when the temperature outdoors drops to the freezing point. But with the aid of an outdoor thermostat which operates two solenoid valves, the supply of water to the evaporator is cut off and the water in the condenser reservoir is drained when the temperature falls below 40 deg. F.

Many are the attributes of this air-conditioning installation. Perhaps foremost is the reduction of meat shrinkage to a small factor. When the meat is purchased, the moisture in it is paid for at the price of meat. And loss of moisture by evaporation has the same effect as the loss of an equivalent weight of meat. Secondly, there is no condensation of moisture on the walls or ceilings to drip onto

the meat and onto the floor. And in this connection it may surprise you to learn that $3,000 was saved in the cost of the plant by eliminating drip gutters.

Other advantages include an even temperature in the coolers, elimination of most of the labor required to oversee the ordinary type of refrigeration installation, and saving in floor space that would be taken up by coil bunkers in a wall-coil system—this space is about 1 ft. on each side of the room.

While these attributes are very real, the greatest dollars-and-cents advantage realized by Gutfreund comes from the power plant. No less than $5,000 a year is the saving being obtained by using diesel engines instead

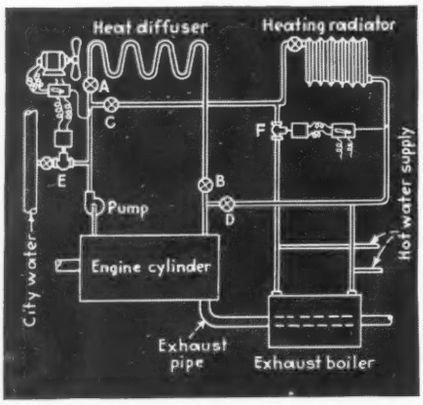


Fig. 3—Schematic diagram of diesel engine waste-heat cycle. In summer, engine cooling water circulates through heat diffuser coil, on roof. In winter valves A and B are closed and C and D opened, circulating the water through the heating radiators of the building. In event engine cooling water becomes too hot, valve E opens automatically to admit city water to the system. If the temperature of the hot water falls too low, valve F opens automatically to admit hot water from exhaust boiler to the system. Evaporator fan is controlled by thermostat in engine cooling water. Hot water supply for plant is taken from exhaust boiler.

of purchasing electricity. And this saving is computed after allowing $1,200 for repair and upkeep of the engines. The $5,000, moreover, does not include the saving resulting from the utilization of diesel waste heat to heat the building and to supply hot water, which amounts to several hundred dollars. And, of course, there must be added to the power-plant savings the saving due to reduction in shrinkage of meat effected by proper air conditioning. This cannot be expressed in dollars and cents, but is of appreciable magnitude.

The diesel plant effecting the big savings consists of two Ruston-Hornsby, single-cylinder, horizontal, fuel-oil engines. One, a 57-hp., 275-r.p.m. unit, drives a 35-kw. a.c. generator and a 17-ton ammonia compressor, operating continuously. The other engine is for standby service. It is a 34-hp., 320-r.p.m. machine connected to a 10-kw. generator and an 8-ton ammonia compressor. Each engine is connected to its generator by V-belts and to its compressor by a magnetic clutch and V-belts. The engines are equipped with exhaust silencers, so that they cannot be heard anywhere in the plant except the basement.

No. 2 fuel oil is used in these engines, costing 6 to 7 cents a gallon. One pound of the fuel supplies 19,000 B.t.u. of energy. The diesel converts about one-third of this into power to drive the compressor and generator. Another third is dissipated as heat through the exhaust and the remaining third as heat in the cooling water. The efficiency of these engines as prime movers is high, which accounts for much of the saving. But even so, the waste heat is used, and it is more than sufficient to meet the building's needs for heating and hot water. Which means that no boiler and fireman are needed to supply heat. To operate the diesel plant costs about $2,500 a year.

Waste-heat utilization is accomplished by circulating the engine cooling water through the heating radiators of the building during the winter months (see Fig. 3). Then an exhaust boiler supplies hot water and also additional heat for the building when needed. Hot water from this boiler is admitted to the cooling-water heating system automatically when the temperature of the latter falls below a certain point. This automatic control is by means of a solenoid valve actuated by a thermostat. A second automatic control of this type protects against a dangerously high temperature in the engine cooling water by admitting cold city water to the system if needed.

In summer, when no building heat is required, the engine cooling water is passed through a heat diffuser located on the roof of the plant. This diffuser consists of a coil through which the hot cooling water is circulated and a fan that blows outdoor air over the coil. A thermostat in the water turns the diffuser fan motor on when the water is too warm and off as the temperature drops.

To circulate the engine cooling water, a 40-gal.-per-minute centrifugal pump with a 45-ft. head is employed, a similar pump being used for standby. Fig. 3 represents schematically the waste-heat cycle of the engines.

The amount of space to be heated in the building is not great, there being only the offices, a small storage room and locker rooms. No heat is required for processing, but hot water is needed for cleaning plant equipment.

As an added economy, the lubricating oil used in the engines is reclaimed by filtering through fullers-earth cartridges under pressure in a Briggs clarifier. This reclaims the oil at a cost of 7 or 8 cents a gallon.

Not involved in the major engineering accomplishments of the plant, but nevertheless of high practical value, are a number of special designs of plant equipment. Among these are the cooler lamps, which drop from the ceiling to a point even with the meat rails. Each of these lamps is suspended from a ball-and-socket joint at the ceiling so that if the reflector is struck it simply swings aside and does not bend or break. But even more practical are the specially built meat shelves. Each shelf is made of one piece of sheet metal, with die-cut grill work and a rounded front edge. This construction not only makes the shelves light enough for one man to handle in cleaning, a job done once a week, but the rounded front edge permits a heavy cut of meat to be slid onto the shelf without tearing the meat on the bottom side. Important, too, from the standpoint of personnel efficiency, is the automatic interdepartment telephone system. By pushing one of six buttons, connection is made with any one of the six key departments of the plant.

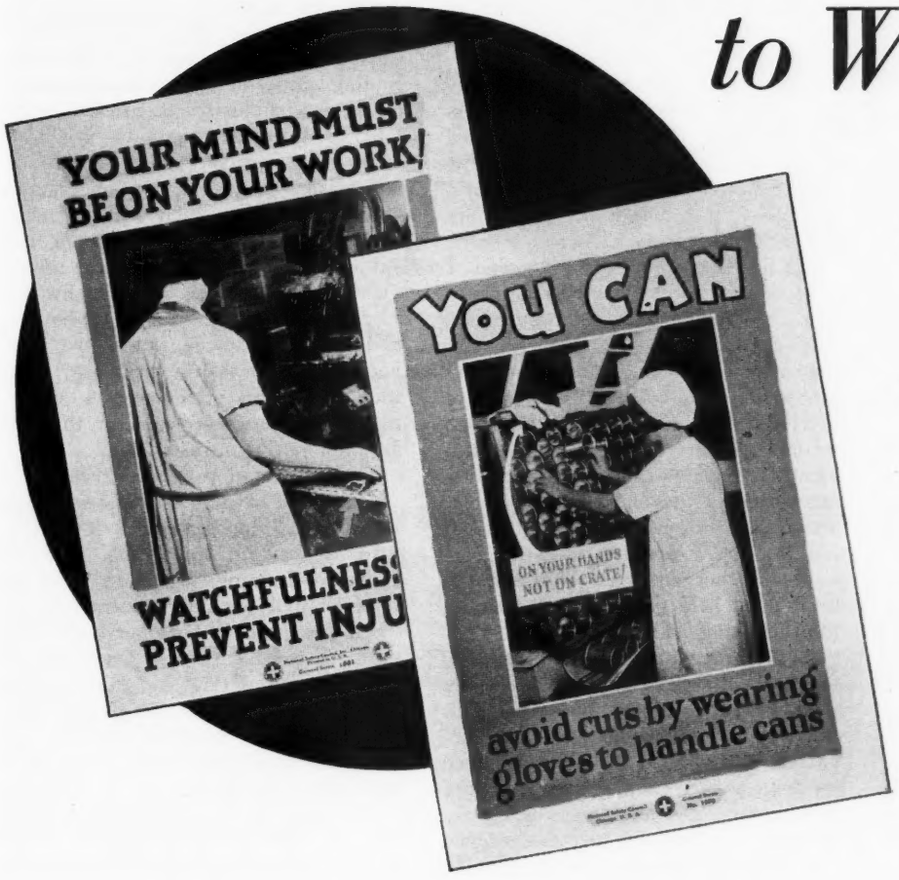
▶Not only does this article tell how sound engineering is saving enough in operating expense to write off the cost of the air-conditioning and power-generation equipment in about three years, but it details advanced practices in air conditioning, power generation, waste-heat utilization and automatic control. It is a food-plant engineering story with a message for

All Food Manufacturers

Space does not permit detailed description here of the temperature and pressure controls used in this plant. But the construction and operation of these types of controls are explained in Automatic Control of Batch Process Temperature, FOOD INDUSTRIES, *May, 1936, and in Automatic Control of Pressure,* FOOD INDUSTRIES, *September, 1936.*

ACCIDENTS *to Women*

How Can Food Plants Eliminate Them?


YOUR MIND MUST BE ON YOUR WORK!
WATCHFULNES
PREVENT INJU
YOU CAN
ON YOUR HANDS NOT ON CRATE!
avoid cuts by wearing gloves to handle cans

By ELLEN D. McKEON
American Mutual Liability Insurance Co., New York, N. Y.

▶***Accidents don't pay. Every plant manager knows that. What he does not know, sometimes, is how they can be eliminated. And accidents to women employees often are particularly troublesome, because both the causes and the methods of elimination involve the physique, psychological characteristics, habits of dress, and disciplinary requirements of women. These differ from the same factors as regards men. So in this article, a qualified woman brings her experience to the aid of***

All Food Manufacturers

AN ACCIDENT occurred recently to a woman in a fruit evaporating and preserving plant, when she fell while carrying glass, and lacerated her hand. The plant report on the accident developed that syrup was on the floor, causing a slipping hazard. The management's contribution to the investigation was an insistence that they were exerting a good quality of effort to keep floors particularly clean, especially in departments where spillage of material was practically unavoidable. They seemed proud of that and satisfied with their situation.

That accident illustrates a poor example of accident analysis. The true cause had not been determined; we know nothing of the actual manner of carrying the glass or the characteristics of the woman, the condition of her footwear, or the exact reason for the spillage at this part of the plant. In the face of an alleged organized purpose throughout the plant, accident analysis had not attacked in a scientific manner.

Another preserving plant had a very poorly arranged plant, and as a consequence, had a very poor accident record. Following a conference, the management saw the connection between these two facts and attacked the problem of accidents to their women employees in a basic manner. Today they have a very fine arrangement, with good housekeeping, clearly defined aisle space, brick floors properly sloped for drainage, and each girl working on wet floors is provided with rubber boots. A first-class dispensary has been installed, and each accident is fully investigated and analyzed at a subsequent safety organization meeting.

As illustrating basic defects, I should like to touch on the following cases:

A girl, while peeling potatoes, blistered her fingers. She did not report for hospital treatment with the result that infection developed.

A girl, in a large candy factory, was cleaning a machine which was in motion. She caught her right hand in the machine and crushed the back of it, breaking three bones. The plant was in good condition from a physical standpoint; it was probably one of the best guarded plants in the vicinity. This particular girl had been instructed against the practice of cleaning machines while in motion. The accident was the result of direct violation of instructions.

Based on a paper before the Food Section, 26th National Safety Congress

As illustrating the need to give serious consideration to female psychology, let me give you the following from an engineer's notebook. The engineer misnames it "A Comedy."

"The scene is a candy factory in the east. The characters are the company management and 300 women employees. The first act is the elevator, a freight elevator, with an open shaftway, landing entrances protected with automatic vertical gates. It is ten o'clock. A woman employee, an enrobing machine operator, is descending in the elevator. She is alone. This is contrary to company regulations as is shown by a sign in the elevator. The woman utters a scream which runs from end to end of each of the three floors of the factory. She falls to the floor of the elevator. The car reaches the bottom floor where it stops automatically. Shortly, 300 employees have gathered around the landing entrances. Foremen lift the unconscious form of the woman to the factory entrance. A few minutes later an ambulance shrieks to the doorway, and then away to the hospital.

"The factory employees, however, do not return to work. Throughout the plant they gather in buzzing groups. Some laugh shrilly; others weep. They are emotional. The foremen say to go back to work. Gradually most of the women return to their work, but they cannot sit still. They drink water; they go to the rest room. The management announces that the hospital has been called and the woman is wholly uninjured. She fainted when her dress caught on something in the shaftway. That is the truth, but the employees do not believe it.

"The final curtain does not fall until the third day. The elevator rider has returned to work and confirmed the management's announcement. Production that has been interfered with gets rolling again.

"The moral: The shaftway should not have been unprotected, but had the management enforced safety rules, the enrobing machine operator would not have been on the freight elevator. Dislocation of work should not have occurred."

Successfully to cope with the problem of accidents which seem peculiar to women, it is necessary to make provision for those differences of temperament, nervous and physical balance, personal habits, and natural expectation which rest on the average between male and female employees. My suggestion, therefore, is not for an attack on the basis of women in the plant, but for an attack on the basis of people in the plant, with provisions for meeting the needs of female physique and psychology.

Women, like men, must be painstakingly made safety conscious. It is easy for those who have been educated to the need for safety, and who know from experience the results of injury, to realize the importance of safety consciousness. But those girls who were injured in accidents which I have mentioned in this paper and who may be injured again, or those others who are prospects for injuries, are not so well informed individually along safety lines. I doubt if protective habits are being patiently grown into them as a part of their daily equipment. It remains the duty of management to keep the question perpetually active and foremost in the minds of the workers. A spurt once or twice a year is not enough. The management must help grow mental crutches for their support.

A general analysis of the accidents which have occurred to women in the food industries does not reveal that the same result could not have occurred to men. If accidents occurred more to women than to men, they are to be interpreted broadly as being peculiar to women only because women are employed in those places or because, in certain respects, women are more prone to accidents than are men. Defects of management, such as are shown by analysis treatment of the record, do not relate less to men than to women. When managerial neglect permits of spilled material, poor discipline, inadequate supervision, careless foremanship, inadequate provision of protective equipment and poor housekeeping, the fact of the employee being a woman has no direct bearing on the question.

In an organized plan should be included the necessary ways and means of reducing the number of injuries caused by falls. That has been the leading cause of accidents to women in the food industry, and in other industries, for some time.

Do not overlook proper choice of supervisors—people who understand and can handle women with the skill that the problem demands. Bring the subject to the foreground in the minds of women employees by friendly advice, by constant vigilance, by posters and signs conspicuously posted, but above all by proper instructions. And then, when an accident does occur, make it a constructive factor through an illuminating investigation.

So very often you read a cause of an accident which states something like this: "Tripped and fell at work—injured left arm and knee," "Fell by radiator—burning arm and injuring knee," "Fell on floor—burned arm," "Fell down steps—hurt her back." No constructive mention is made of the *reason* for the fall, and still that is the one solid contribution which hindsight can offer to foresight—the one grain of knowledge through which to help create a science.

We have found that sprinkling china clay on oily floors and then sweeping it up with a push broom, leaving just a light film on the floor, is a good safety measure to eliminate slipping and falling. Try this on greasy floors in the food industry.

A bad accident occurred in a bottling plant recently when a girl fell down the stairs. The stairs were in very poor condition, but the concern for which the girl worked was a tenant, and had nothing to do with the maintenance of the building. Every effort was being made to get the owners to repair the stairs. In the meantime, that plant had to keep the question of the stair condition in front of their employees continually. It was one of the eternal vigilances on which they could ill afford to let down. But, even with all vigilance, an accident occurred there.

The choice of women employees is very important. Locality and kind of work sometimes influence class of help, but even at that, the differentiations which exist between individuals are not peculiar entirely to locality, education, or class. Traits of mind, height (*Turn to p. 309*)

Brand names and other information can be printed on the wrapper of each individual 4 or 8-oz. portion through the use of a new method of cheese curing and distribution developed by the Bureau of Dairy Industry, United States Department of Agriculture.

Distribution Economy And Brand Acceptance Advanced by

NEW METHOD of Curing and Packaging Cheese

CHEESE DISTRIBUTION should undergo many changes as the result of a new method of preparing American Cheddar cheese for the market. This method should increase the consumption of cheese, because for the first time it will make available natural American Cheddar cheese prepared in 4 and 8 oz. individually wrapped consumer packages. Further, each individual package may now carry the trade brand identity of its maker, permitting the manufacturer of unprocessed cheese effectively to use national brand advertising.

American Cheddar cheese is cured and aged in "Young America's," weighing 11 lb.; "Daisies," weighing 22 lb.; "Flats," weighing 30 to 33 lb.; and "Cheddars" weighing up to 70 lb., and other similar forms. These sizes are inconvenient and wasteful. No matter what the size or shape, retailers have to cut the large pieces into small irregular units for the consumer. Both the cut pieces and the remainder dry rapidly. Whatever the size of the original cheese, the retailer has to accept losses from evaporation between the time he bought the original cylinder and the time he finishes selling it piece-meal to consumers. Not only does the retailer suffer a loss while the cheese remains in his store, but also the producer. The producer's loss from evaporation comes during the time when the cheese is being aged.

When the valve-vented can was introduced, it opened new avenues for curing and aging American type Cheddar cheese. The first application of the valve-vented can to the curing of cheese, a method developed by the Bureau of Dairy Industry was discussed in FOOD INDUSTRIES, July, 1934. The procedure of curing cheese in valve-vented cans was investigated by L. A. Rogers, Chief of Research Laboratories, Bureau of Dairy Industries, U.S. Department of Agriculture, who reported on the application to the aging of small quantities of cheese to be sold direct to the housewives in the can in which it was aged. Before the end of the year, Land O' Lakes Creameries, Inc., Minneapolis, placed on the market a consumer sized tin of cheese aged in the valve-vented can (FOOD INDUSTRIES, November, 1934).

Although the 8 to 12-oz. consumer size cans overcame certain disadvantages of the method of aging the cheese in exposed 5 to 70 lb. cylinders, there still remained disadvantages which the Bureau of Dairy Industry has continued to study. The Bureau now reports a method which overcomes most of the remaining difficulties. This method permits aging in larger sizes of cans than 8 to 12 oz., which also eliminates evaporation losses and the formation of rind, cuts the cost of packaging. Curing and aging cheese in cans permits marketing the product in 4, 8 and 12-oz. prints, wrapped and trade branded.

The improved method tested by the Bureau employs the 5-lb. valve-vented can. Twenty 4-oz. prints wrapped separately can be aged in this 5-lb. can as readily as a 5 lb. loaf of cheese. This container is not intended as a consumer container, but one for the retailer who, when he receives it,

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▶ ***Economy in distribution and successful brand promotion are two factors of first importance to every food manufacturer. Gradually the difficulties lying in the way of achieving these ends are being eliminated through improved methods of processing and packaging. This article tells of a step forward in this direction for the marketing of cheese and will be of particular interest to makers of***

Perishable or Semi-perishable Foods Marketed in Self-Service Stores

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opens it and removes the twenty 4-oz. or ten 8-oz. prints and sells them as individually wrapped and trade branded consumer packages.

Dark spots will form on the cheese wherever it comes in contact with tin. Therefore, only lacquered cans should be used, and as an extra precaution against the possibility of an exposed tin surface, it is advisable to wrap the cheese before placing it in the can, whether the cheese is cut into consumer size prints or aged in a 5-lb. loaf. It is also advisable to wrap the 4-oz. or 8-oz. prints in moisture-proof material because this prevents evaporation losses from the prints when removed from the can and displayed in the retail store.

A number of different types of wrappers are both suitable and available for wrapping cheese that is to be cured in the valve-vented can. When packing cheese in a consumer sized can, the type of wrapper is less important (so long as it does not taint the surface of the cheese) than when packing ten 8-oz. prints or twenty 4-oz. prints in a 5-lb can. In the latter case, moisture-proof wrappers should be used to protect the cheese while on display in the store, after removing from the can.

Parchment wrappers are suitable for wrapping cheese packed in consumer size cans which are not opened until the cheese is ready to be served. A moisture-proof wrapper is not important. If the cheese in the can is held at too high a temperature, a certain amount of fat collects on the surface of the cheese. Parchment wrappers have the advantage of absorbing much of this fat. Vegetable parchment is less expensive than most other suitable wrappers, it is easy to handle and the labor cost of wrapping may be slightly less than that of other material.

Both tin and aluminum foils are suitable for wrapping cheese to be secured in 4 or 8 oz. print sizes in the 5 lb. can. Because of the moisture-resistant qualities of tin or aluminum foil, cheese wrapped in either will not dry out for several days after it is taken out of the can. Tinfoil is tougher and in this respect more desirable. Both tin and aluminum foils make a very attractive package and do not stick to the can. Transparent cellulose is also suitable for wrapping cheese cured in consumer sized cans and for the 4 and 8 oz. prints, cured in the 5 lb. cans. It is, however, not desirable for wrapping a solid 5 lb. loaf because it sticks to the tin and interferes with removing the 5 lb. loaf from the can. If 12 oz. of cheese are to be packed in the consumer sized cans, the plain transparent No. 300 mat should be used. Heat-sealing No. 300 mat should be used when 4 and 8 oz. prints are wrapped and cured in 5 lb. cans. Sylphrap, Kodapak and Cellophane are satisfactory transparent wrapping materials. One of the advantages of using transparent celluloses is that the ends can be heat-sealed and the wrapper does not loosen and come off of the cheese as a result of handling. These products also have the advantage of transparency and permit the customer to see the cheese without removing the wrapper.

The cost per pound of cheese for wrapping 8 oz. prints in each of the several possible wrapping materials varies considerably. Parchment-backed, pure tinfoil for wrapping 8 oz. prints to be cured in 5 lb. cans will cost slightly over 1 cent per pound of cheese, aluminum foil from six-tenths of a cent to 1 cent per lb. of cheese, transparent cellulose, ½ of a cent per pound of cheese and parchment from .1125 to .15 of a cent per pound of cheese.

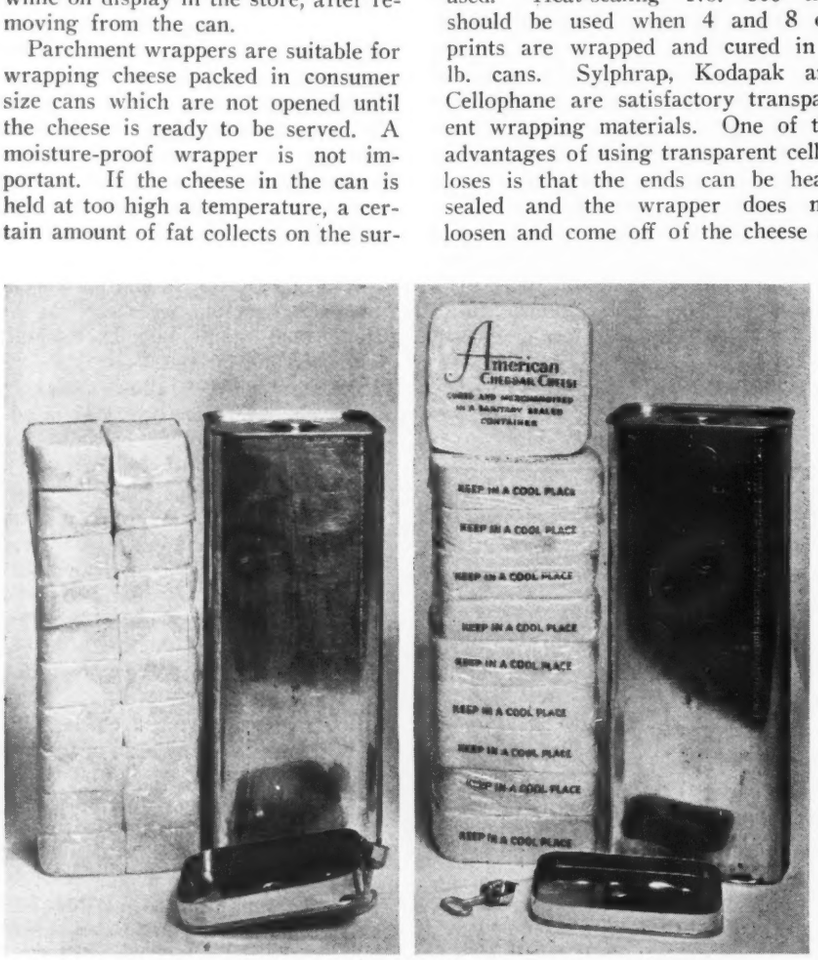
Wrappers for the 8 oz. print should be 10 in. long and 6 in. wide. The wrapper should be folded neatly around the cheese and the folded end sealed with a hot plate which should be set flush with the top of the table used for wrapping. Four-ounce prints wrapped in the same manner require a wrapper 6-$\frac{7}{8}$ in. long and 5-$\frac{3}{8}$ in. wide.

Tests were run to determine the moisture resistance of materials to be used for wrapping cheese cured in cans. For this test six 8-oz. prints wrapped in parchment, six wrapped in aluminum foil, six in tinfoil and six in Cellophane, all of which had been cured in cans for eight months, were weighed when taken out of the can and placed in a refrigerator at a temperature of 50 deg. F., with the relative humidity of about 70 per cent. All the samples were left in the refrigerator for a period of four days. Each print was then reweighed and evaporation loss determined. The prints wrapped in parchment dried out considerably and the loss in weight was excessive. There was no noticeable drying out of the print wrapped in tinfoil, aluminum foil or Cellophane. Neither was there any apparent development of rind or loss of appearance. The weight loss was insignificant in each case. Tinfoil, however, had the smallest loss in weight, aluminum foil second and Cellophane third.

All types and sizes of cans in which cheese is packed should be constructed to open with a key. Key-opened cans leave smooth edges which permit the cheese to slip out of the can without injuring the wrapper or gouging the cheese.

Because of the extra labor required and additional shrinkage when aging at higher temperatures, cheese aged by the old method in 5 to 70-lb. cylinders is usually held at a temperature of 34 deg. The higher the aging temperature, the more rapid the

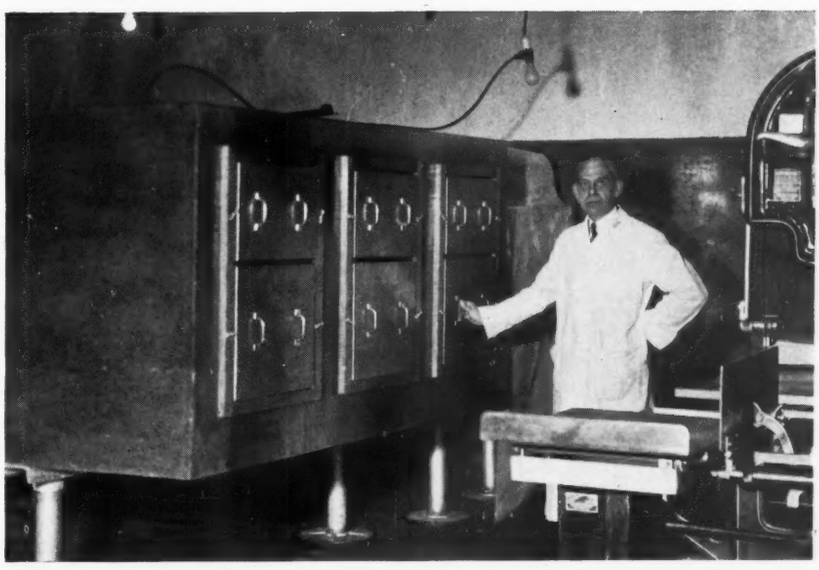
(*Turn to page 310*)



Ten 8-oz. or twenty 4-oz. prints of cheese can be cured and distributed in a valve-vented can of 5 lb. capacity.

Wild Growth Threatened for FROZEN FOODS

By IVAN C. MILLER
Distribution Editor, FOOD INDUSTRIES



It cost only about $800 to build this quick-freezing cabinet used by Adolf Gobel, Inc., to quick freeze meat. Dry ice is the refrigerant; a small fan is used to provide circulation inside the cabinet. Cost of freezing is under ½ cent a pound.

"THE FROZEN FOOD INDUSTRY is growing like a weed," is the comment of those freezing foods, of those who understand the basic problems of the frozen food industry, and of uniformed ringside commentators alike. The frozen food industry is growing. The frozen food directory appearing in the April issue of FOOD INDUSTRIES, recorded a 43 per cent increase in "quick frozen" foods during 1937, and an increase of 56 per cent for all frozen foods. Forty-six of the 62 companies quick-freezing in 1937 reported their estimated 1938 output, 27 per cent ahead of the total 1937 production. These figures do not include the output of those companies who may venture into food freezing during 1938.

In more than one way is the frozen food industry "growing like a weed." A weed, according to Webster's Dictionary, is a "wild growth—any plant growing in cultivated land to the injury of desired vegetation." Those vitally interested in frozen foods have grave apprehension that the frozen food industry will grow like a weed. Superficial facts, insufficient facts or lack of facts, they fear may encourage far too many to engage in the freezing of food.

The carry-overs of canned fruits and vegetables with but rare exceptions have mounted steadily during the last few years. Many canners may be tempted to reduce their carry-over of canned goods by freezing a portion of their production. If, however, many newcomers attempt to enter the frozen food field, two results are certain to occur: Inferior products will find their way to the market and destroy much of the acceptance for frozen foods already built. A surplus will be created which will bring about dumping, price-cutting and insolvencies.

Sharp freezer in which cream in cans is being frozen for storage. Direct-expansion ammonia coils supply the refrigeration.

Although demand has kept pace with production during the last few years, cold storage holdings of frozen fruits and vegetables on March 1, 1938, were reported by the Department of Agriculture to be about twice those of March, 1937. The average frozen fruits in storage for the period 1933-37 was 57,479,000 lb. Frozen fruits on hand March 1, 1937, were 55,825,000 lb; on March 1, 1938, the figure was 110,807,000 lb. Frozen vegetables in storage on March 1, 1938, were more than twice that of March 1, 1937, being 25,999,000 lb. as compared with 10,291,000 lb.

Meat was one of the first food products to be successfully frozen. Meat freezing has always been conducted by meat packers. However, when freezing was extended to fruit by various pack methods, it was not the canner or preserver who con-

(*Turn to page 284*)

• LOOK FOR YOUR PRODUCT IN THE JUNE FOOD PAGES O

Food manufacturers whose products appear on these reproduced food pages from the forthcoming June issues of the women's magazines can profitably employ the magazines, stimulating influence on impulse buying by using the pages on point of sale posters.

RESULTS OBTAINED from tests made with the cooperation of both independent and group retail organizations to determine the promotion value of women's magazine food pages have been reported in earlier issues of FOOD INDUSTRIES. These tests have proved two facts. Retailers generally welcome this type of display poster more than other types, and cooperate in giving it an opportunity to produce. This type of poster, made by mounting reprints of the illustrated food pages of the women's magazines, produced pronounced increases when used to stimulate sales.

As a result of these tests FOOD INDUSTRIES arranged with the women's magazines to obtain advanced proofs of these pages. The purpose of obtaining these advanced proofs is to describe and illustrate the forthcoming food pages of the women's magazines so that manufacturers whose product or products are among those featured may obtain ready-for-use posters bearing reprints of the food pages and place them in the hands of retailers at or about the same time the magazines reach their readers.

Mounted reprints of these food pages (single pages on 14x22 in. poster board, spreads on 28x22 in. poster board) may be obtained from the magazine ready for use at the following prices:

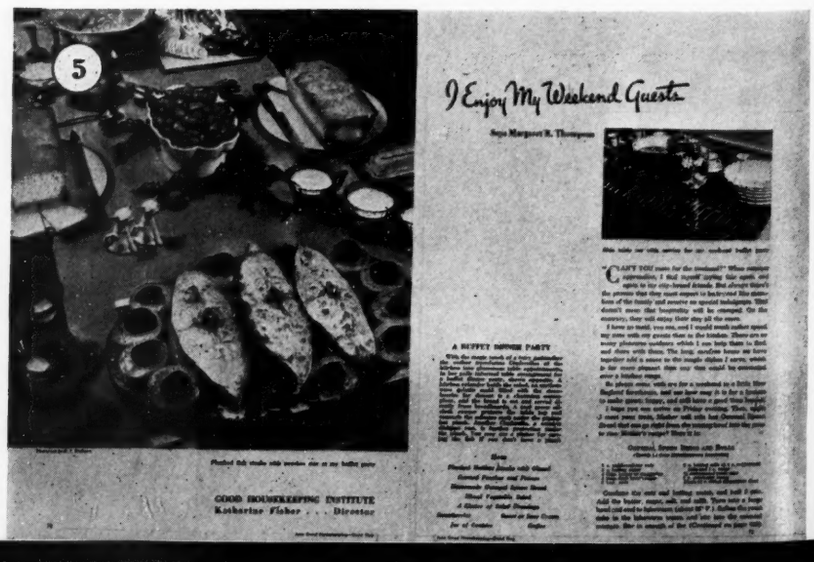
SINGLE PAGE

1,000 to 1,999 inclusive each.....15c.
2,000 to 2,999 inclusive each.....12c.
3,000 and over each.....10c.

TWO-PAGE SPREAD

1,000 to 1,999 inclusive each.....25c.
2,000 to 2,999 inclusive each.....18c.
3,000 and over each.....16c.

Manufacturers may either correspond with any one of the magazines direct, if interested in food pages appropriate for their products or write to the distribution editor of FOOD INDUSTRIES.



S OF THE WOMEN'S MAGAZINES

Each poster will carry the printed line "As seen in the March issue of . . . . . Magazine." The manufacturer's own selection of caption or "selling slug" such as "Try these recipes suggested by "Pictorial Review-Delineator," "New kinds of pies made with gelatin," "Meat and potato dinners call for soup," etc., will be printed at the top of the poster. No poster will bear the name of the manufacturer or his trade brand.

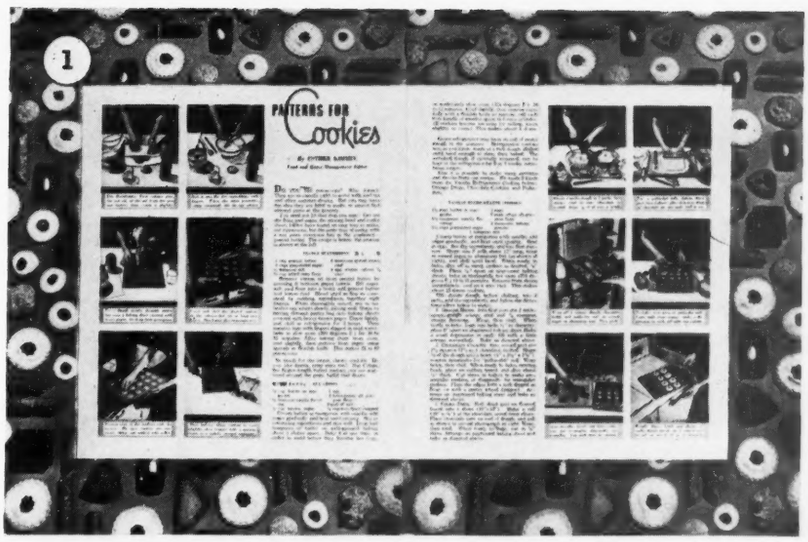
1—PICTORIAL REVIEW-DELINEATOR: Two color spread suitable for the promotion of flour shortening, peanut butter, dried fruits and other cookie ingredients.

2—LADIES HOME JOURNAL: Full color spread suitable for the promotion of eggs, ham, bakery cakes and rolls.

3—WOMAN'S HOME COMPANION: Full color page suitable for the promotion of gelatin, macaroni, boiled ham and canned vegetables.

4—McCALL'S: Full color spread promoting canned grapefruit segments, canned mushroom soup, canned date and nut bread, and cannel asparagus.

5—GOOD HOUSEKEEPING: Color spread suitable for promotion of packaged fresh or frozen fish, steaks, peach halves and dried or canned prunes.



ducted the freezing operations. The freezing of fruit by cold pack method has usually been done by the producer, by cold storage warehouses, to the producer's order, or by industrial consumers of fruits. Pie bakers, confectioners and ice cream manufacturers purchase their winter supply of fruit when the fresh produce market is flush and prices low. These they either freeze or cold pack themselves, or have frozen to their order in a cold storage warehouse. Although frozen fruits are not cold packed by those who normally can fruits, fish are frozen by those who have always prepared fish for the market. Poultry also is frozen by those who normally dress and pack poultry for the market. Quick frozen vegetables, although prepared for freezing at the canning plant, are, however, generally frozen by or for a distributor other than a canner.

This variable situation in the production of frozen foods has given rise to knotty problems of distribution—problems which are still the subject of considerable controversy. The complication of the problem comes through the fact that frozen foods must be maintained frozen with an accurate temperature control from producer to consumer. In every outlet for frozen foods these products must be stored in a refrigerated cabinet and maintained at a controlled, uniform, low temperature. The manufacturer or distributor who has pride in his products and expects to maintain consumer good will for his brand must vigilantly supervise and control the products from the harvest field to the consumers table. Control of temperature, among other things, requires the installation of a relatively expensive cabinet in every frozen food outlet, either by the frozen food distributor or by the outlet owner.

This raises the question of who shall own the cabinet. If the distributor owns the cabinet, then it is practically necessary to supply each outlet with a complete line of frozen foods to meet consumer demands, frozen fruits and vegetables, fish, meat and poultry. The necessary capital investment of such an enterprise should limit the field. If the cabinet is owned by a retailer, there is no long-time control over the products which are stored in and sold from it. Also, the manufacturer or distributor of a product of high quality has no guarantee that his product will not be judged by consumers according to the standard of other products of inferior quality sold from the same cabinet.

Probably this situation is responsible for building up a group of distributors (formed or forming) who supply to outlets a complete assortment of frozen food products. These distributors freeze foods themselves or contract with other manufacturers for their supply of a complete line of frozen foods.

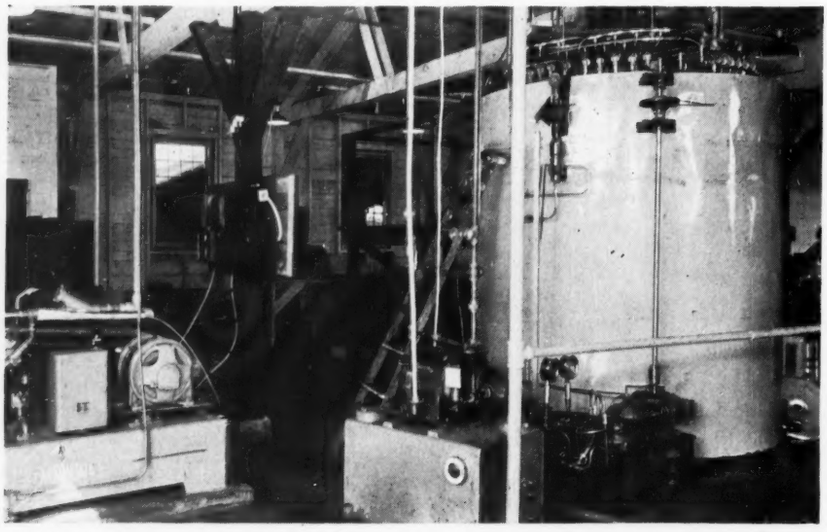
The problems of supplying the industrial and institutional trade has been less complex. This is one reason why the distribution of frozen foods to these markets is well established.

As frozen foods are accepted either by institutions or retail consumers, they replace foods in other forms. Most of the fish sold today has been frozen, whether it is bought in frozen or defrosted state. This is also true of poultry. Today's fresh fish or poultry was frozen fish or poultry yesterday. The competition between fresh and frozen fish and poultry does not greatly affect the processors because, fresh or frozen, the products come from the same manufacturer. This situation does not apply to frozen fruits and vegetables. When frozen fruits or vegetables are bought and consumed by the institution or housewife, either the fresh produce distributor or the canner must suffer from the competition.

Frozen fruits and vegetables have replaced, to the extent used, both fresh produce and canned products. Fresh produce has suffered most. The quantity of frozen fruits and vegetables reaching the housewife through the retail trade is but a small fraction of a per cent of the fruits and vegetables sold at retail, either fresh or in cans. The small amounts of frozen fruits and vegetables which have moved to consumers have been consumed largely at the expense of fresh produce. However, the frozen fruits and vegetable market will expand, undoubtedly too rapidly for the best interest of the industry. This expansion, even though it does not get excessively out of hand, will be accompanied by lowered retail prices, because of lowered manufacturing costs, lower distribution costs, lower retailing costs. Also prices will come down because of closer margins and smaller markups. Price-cutting is an evil that does exist. Price cutting of frozen foods cannot be entirely controlled in the future as it is at present. Price cutting will force frozen food prices down.

Home-consumed frozen fruits and vegetables now replace a small amount of fresh produce, an unnoticed amount of canned products, but when, because of expansion, prices are reduced, canned fruits and vegetables will unquestionably suffer too, in increasing amount. Distant though the critical stage may be, canners face a perplexing situation. Especially is this true of those who market their products under a national brand. It will require considerable capital investment to process frozen foods, distribute them and establish brand acceptance, especially if it proves expedient or necessary for distributors to market frozen fish, meat and poultry as well as fruits and vegetables. At best the frozen food business is hazardous. Past casualties justify this view. However, if the national brand canner freezes only on contract for distributors, he is in competition with himself, depreciating the investment in his own brands.

New alignments are forming in the conflict between private and national brands, with the possibility that manufacturers may find it advisable to straddle by taking a position in their distributor's brand, rather than pioneering in frozen foods.



Equipment for quick-freezing by immersion in a brine or syrup solution, developed by the University of Tennessee. Freezing can be done in six minutes.

PRIZE PACKAGES

Wolf Award

Food packages won five out of twenty first places in the seventh annual American Management Association sponsored competion for the Irwin D. Wolf awards.. Honorable mention also went to six food packages.

DWIGHT EDWARDS Co.'s "Canterbury Tea" received an award for the most effective use of the elements of design to create shelf visibility in the retail store. Beech-Nut Company's "Tops" package was awarded honorable mention.

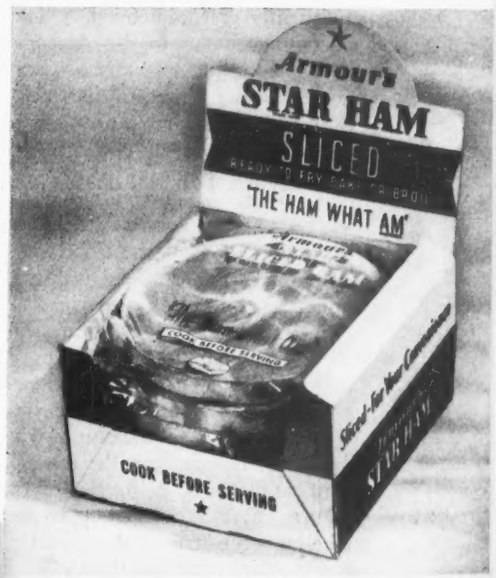
The award for the most effective use of merchandising ingenuity regardless of artistic quality went to Armour & Co. for its package of sliced ham. Each slice in the display carton is a consumer package separately packaged in transparent wrap. Honorable mention went to "S. S. Spray Water Toffee" container, product of R. L. Albert & Son Company and also to Sherfick Farms Company's "No-Drip Honey" container.

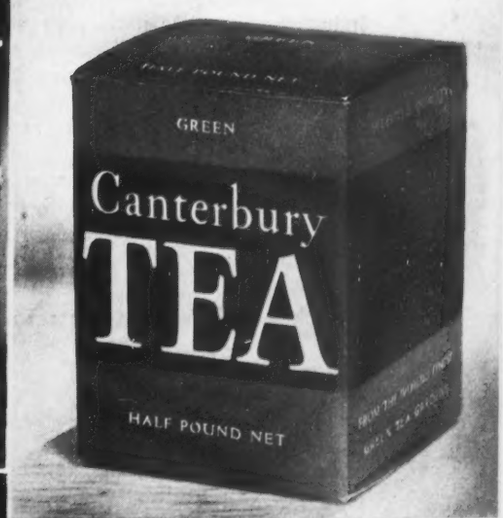
The Sherfick Farms "No-Drip Honey" container was given the award for the most effective package designed to add to consumer convenience regardless of artistic quality. Armour's sliced ham cartons were awarded honorable mention in this classification.

The award for the most effective package insert was given to Cudahy Packing Company for its "Sunlight Egg" carton insert.

Muskegon Celery Cooperative Growers' celery shipping case (described in FOOD INDUSTRIES, October, 1937), was given the award for the most effective shipping container from the standpoint of merchandising and construction ingenuity regardless of artistic qualities. Honorable mention was given "Cafe Rico" coffee can, product of Cafeteros de Porto Rico, for the most effective use of typography or lettering.

A. & P. Company's "Nectar and Our Own Tea" floor display received honorable mention for floor display pieces that most effectively contribute to the selling of the unit package.





Photographs by the courtesy of Seidman Photo Service.

Merchandising

HINTS AND HURDLES

Labels Must Tell Use

THOSE who addressed the unit package sessions of American Management Association's Packaging Conference in Chicago in March, stressed the importance of considering the requirements and demands of the consumer body politic. Descriptive labels were frequently recommended. The important element to be described on labels according to many of those who addressed the conference is an explanation of the use or uses of the item.

Program for All Associations

W. R. M. WHARTON, chief of the eastern division of the Food and Drug Administration, outlined for the Olive Oil Association of America a four-point program for gaining the approval of consumers as follows: (1) build a strong association of members committed—without any reservations whatever—to fair dealings with the public, including both the more intelligent and less intelligent consumers, (2) adopt a strict policy of truthful labeling—the truth, the whole truth and nothing but the truth on labels, (3) set up a system under which the industry will police itself, (4) undertake by advertising—built around a distinctive emblem, perhaps—to educate consumers to understand that merchandise protected by the emblem is honest and is honestly and frankly labeled and entitled to consumer confidence. This program could profitably be adopted by all food product associations.

"Misleading in a Material Respect"

THE WHEELER-LEA ACT, amending the Federal Trade Commission Act, places a responsibility on food manufacturers which requires vigilant supervision of all advertising. Particularly is this vigilance required between now and the time when a sufficient number of test cases have come before the Federal Trade Commission to clarify and define the law. The law provides that when advertising, in any advertising medium, is considered to be misleading to the detriment of consumers, then that advertising (regardless of intent and in spite of dissenting opinion and evidence) may be subject to action by the Federal Trade Commission. Through this act the Federal Trade Commission has the power to issue a cease and desist order, grant a temporary injunction or restraining order without bond and even bring criminal procedure against the individuals of a company whose produce is deemed falsely advertised, in the sense that the advertising is "msleading on a material respect." Few food manufacturers will welcome a test case of any of their advertising. Since there is as yet no yardstick for measuring the limits of the act, food manufacturers can only take every precaution to be certain that no advertising reaches the consumer which might in any way be judged "misleading in a material respect."

Estimated Annual Consumption of Meat in Various Countries
(Kilogrammes per head of population)

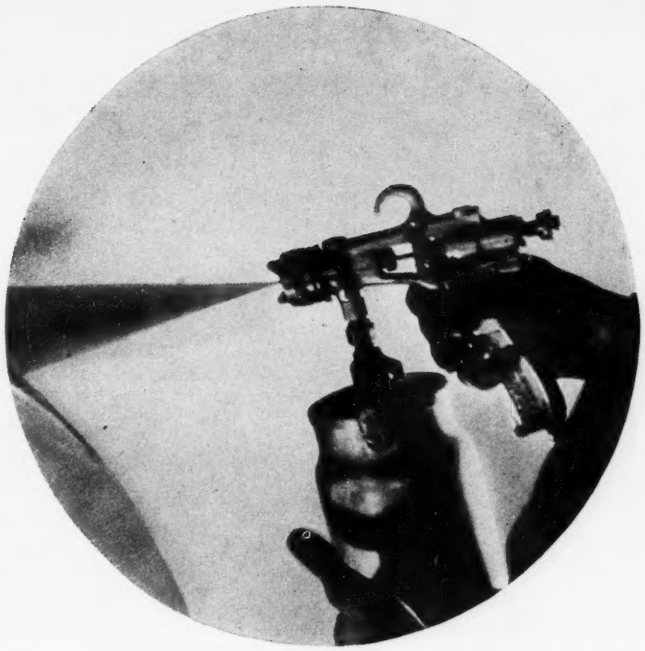
Countries	Total meat (2)		Beef and veal		Mutton and Lamb		Pork, bacon and Lard	
	1925–29	1930–34	1925–29	1930–34	1925–29	1930–34	1925–29	1930–34
Argentina	126.8	120.8	114.0	108.4	7.3	6.8	5.5	5.6
New Zealand	106.8	103.8	60.4	53.9	35.9	41.8	10.5	8.7
Australia	107.2	91.5	69.0	46.2	30.0	37.3	8.2	8.0
Canada	69.1	65.4	30.9	27.5	2.8	3.2	35.4	34.7
United Kingdom	62.4	63.7	31.5	29.1	12.3	13.9	18.6	20.7
Denmark	47.0	62.4	21.9	26.4	....	....	25.1	36.0
United States	62.3	61.9	24.2	23.4	2.5	3.1	35.6	35.4
Esthonia	58.4	53.4	14.6	19.2	7.0	5.4	36.8	28.8
Germany	49.9	51.1	17.2	16.2	0.8	0.6	31.9	34.3
Switzerland	44.2	47.3	25.5	25.5	0.7	0.6	18.0	21.1
Netherlands	42.5	45.6	20.0	17.9	0.4	0.5	22.1	27.2
France	41.7	43.5	21.2	22.7	3.2	3.1	17.3	17.7
Belgium	36.2	39.2	19.3	18.1	0.6	0.6	16.3	20.5
Sweden	38.7	36.1	19.0	14.0	0.7	1.1	19.0	21.0
Czechoslovakia	34.2	33.3	13.3	12.5	3.4	3.3	17.5	17.5
Norway	31.0	33.1	14.4	14.7	5.5	5.4	11.1	13.0
Finland	28.3	26.7	14.5	13.3	1.8	1.3	12.0	12.1
Russia	23.2	....	9.9	....	4.7	....	8.6	....
Roumania	....	22.0	....	7.5	....	3.5	....	11.0
Poland	18.0	18.7	6.9	7.3	0.3	0.2	10.8	11.2
Italy	19.8	16.1	11.8	9.8	1.6	1.3	6.4	5.0

(1) Except for France, Russia and Argentina all figures are taken from League of Nation statistics.
(2) Excluding poultry and game, goats and horse flesh.
One kilogramme equals about 2.2 lb.

Evidence of the trend toward pre-packaging perishables into consumer packages designed for self-service, comes from markets in Canada. Illustrated here is a self-service Canadian store display of price marked consumer packages of oranges, apples, and bananas.

Per Capita Consumption of Meat

ACCORDING TO the International Institute of Agriculture, per capita meat consumption depends largely on the climate of the country. Peoples in cold climates consume more meat per capita than peoples in warm climates. The character of the land is also a contributing factor. Japanese living on mountainous islands consume but 2.6 Kg. of meat per person per annum, while inhabitants of the grazing land countries of Argentina, New Zealand and Australia consume more than 100 Kg. per person per annum. Largest amounts of meat per person are consumed by Europeans and emigrants from Europe to the Americas, Australia and New Zealand.



Problems in PAINTING Motor Vehicles

Getting the Most Out of the Finish

THE APPEARANCE, maintenance costs and resale value of motor vehicles are all affected by the type of finish used, the color selected and the protection given the finish. These and other problems—such as choosing a paint that will minimize the appearance of large size in trucks and trailers—must be worked out by fleet operators who want to get the most at the least cost out of their equipment. Answers to these problems are given in the following statements by men who are operating trucks in the food field.

Answers to Many Questions

As to fading, I would say colors made with the raw earth colors, like umbers, red oxides, ferrite yellow, yellow ochre, raw sienna, and so forth, will not fade. Colors made with this type of pigment are usually the dark and light tans and browns. As to dulling, a color that contains considerable white pigment is the most susceptible to chalking or dulling.

The colors which are less liable to show dirt, mud, etc., are the light tans and some light browns, also the lighter grays. Blacks and dark blues are the most difficult to keep looking clean.

To minimize the appearance in size of large trucks and trailers, use a dark color, or black, with light and bright trim colors being used sparingly. Horizontal lines or streamlining should be avoided.

There is a lot of advertising value to be gained from the use of bright color combinations. And all bright or "flashy" colors are not unsatisfactory for durability. It is possible to get good wearing colors in yellow, red and greens. A "flashy" or attractive combination may be obtained by using aluminum with red, blue and green trim. Aluminum wears particularly well in finishes made for use on vehicles.

It is not very important that certain colors be used on refrigerated trucks and trailers to reflect heat from the body. With the use of certain insulating materials which are available today, color plays a very little part. Light colors and aluminum bronze give the best heat reflectance.

Synthetic type enamels are no doubt the most durable finish, particularly the high-baked type. However, there are some very good lacquers being made today that have excellent wearing qualities if applied over the proper primer coats.

A protective coat of wax helps to preserve the finish and also makes it easier to keep the finish clean. Application of wax coats would vary due to the weather and exposure encountered.

Repainting is usually done when inspection indicates it is necessary. Too much paint is as bad as too little.

Small scratches, if all the way through to the metal, should be touched up immediately, as they will result in larger spots quickly, if exposed. Whether retouching is done by spray or brush depends upon the size of scratch. Small sharp scratches can be very well touched up with a striping or pencil brush. A spray gun is usually used when a larger section of the finish is to be repaired.

Most of the companies operating large fleets of trucks find it more economical to maintain and operate their own paint shops than to have the work done outside—GLENN M. DAVIDSON, *plant superintendent, Durkee Famous Foods, Elmhurst, N. Y.*

Flashy Colors Have Value

In motor-vehicle finishes, light colors are the best for resisting fading and dulling. The easiest to keep looking clean is green, while cream is the most difficult. To minimize the appearance of large size, trucks and trailers can be painted light green or gray.

We believe that "flashy" colors justify their use on motor vehicles through their high advertising value, even though they may not be as durable as some less flashy paints. And in selecting the paint for refrigerated trucks, it is important to use a finish that is effective in reflecting heat.

As a finish for motor vehicles, we have found enamel more durable than paint or lacquer. It is economical to put a protective coating of wax over the finish, and we apply this semi-annually. We repaint our motor vehicles approximately every three years, but we follow no regular repainting schedule. Minor disfigurations of the finish, such as scratches, are retouched immediately, and a spray gun is used to apply the retouching paint.

To handle our painting and retouching work, we find it more economical to operate our own paint shop than to have the work done outside.—T. R. LEADBEATER, *traffic manager, Larsen Baking Co., Inc., Brooklyn, N. Y.*

Distribution QUESTIONS CLUB

All spic and span on dress parade is this fleet of eight Internationals used by the Seybold Baking Co. for the distribution of bread and cakes out of Orlando, Fla.

Trucks Aid in Florida's Localized Bread Sales

Decentralized Distribution Due to Great Distances Between State's Big Cities

EXCEPT for the lack of cold weather operation and its attendant difficulties, the baker's problems of motorized deliveries in the State of Florida are much the same as in many other parts of the country. Lacking the large-population, industrialized cities of the East and Middle West, Florida has its offset in the large tourist trade during the winter months.

Although Florida ranks fairly low in the annual per family consumption of bakery products as told in FOOD INDUSTRIES for April, 1938, the tourist trade in these items presents peak-period problems in several of the state's seacoast cities. Jacksonville, the state's largest city, with a population of about 130,000, is located on the east coast, at the northern end of the state. Miami, with a population of about 115,000, is also on the east coast but almost at the extreme southern end of the state. Tampa, the state's next largest city, with a population of about 102,000, is on the west coast, about midlength of the state. The road mileage between Jacksonville and Miami is about 350 miles; between Jacksonville and Tampa, 220 miles, and between Tampa and Miami, 260 miles.

Accordingly, the state does not lend itself to the large centralized bakery with bread transports serving fairly close urban centers but rather to the decentralized, smaller plant, each serving its own local sales area.

Such is the merchandising plan of the Seybold Baking Co. which has one plant in Orlando and four others throughout the state. Orlando is almost midway between the two coasts, about 55 miles southwest from Day-

The fair customer, the storekeeper and the Seybold driver salesman are grouped under the protection of the awning of the Orlando, Fla., grocery store shown above. Note the truck's convenient side door and how the bread is carried in paper cartons on three levels in the truck body.

Close-up of one of the Seybold company's Orlando trucks with G. C. Sapp, manager of the plant, apparently well pleased with the day's sales. The extra load roof rack and side ladder distinguish this baker's truck body.

tona Beach and has a population of about 28,000.

At Orlando, the Seybold company operates a fleet of eight trucks. These are all Internationals and are shown in greater detail in the accompanying illustrations. Two of the units are fitted with roof racks as shown to carry extra loads on the peak runs.

The truck bodies are typical in design with an integral driver's cab and a side door on the right or curb side. For ease in loading and unloading, the loaves of bread are loaded into the truck bodies in paper cartons as shown in one of the views.

The bodies of the Seybold trucks, like those in other parts of the country, are made as dust proof as possible with door gaskets to keep out dust and dirt. The exhaust line in back of the muffler is carried back beyond the rear axle. This minimizes the chances of the exhaust gases working their way into the body interior and tainting the bread. Cellophane wrappings on the loaves also help to keep the bread from absorbing odors of any kind.

In keeping with the trend to use light colors on food products trucks, the bodies are cream colored above the belt line with a darker shade below.

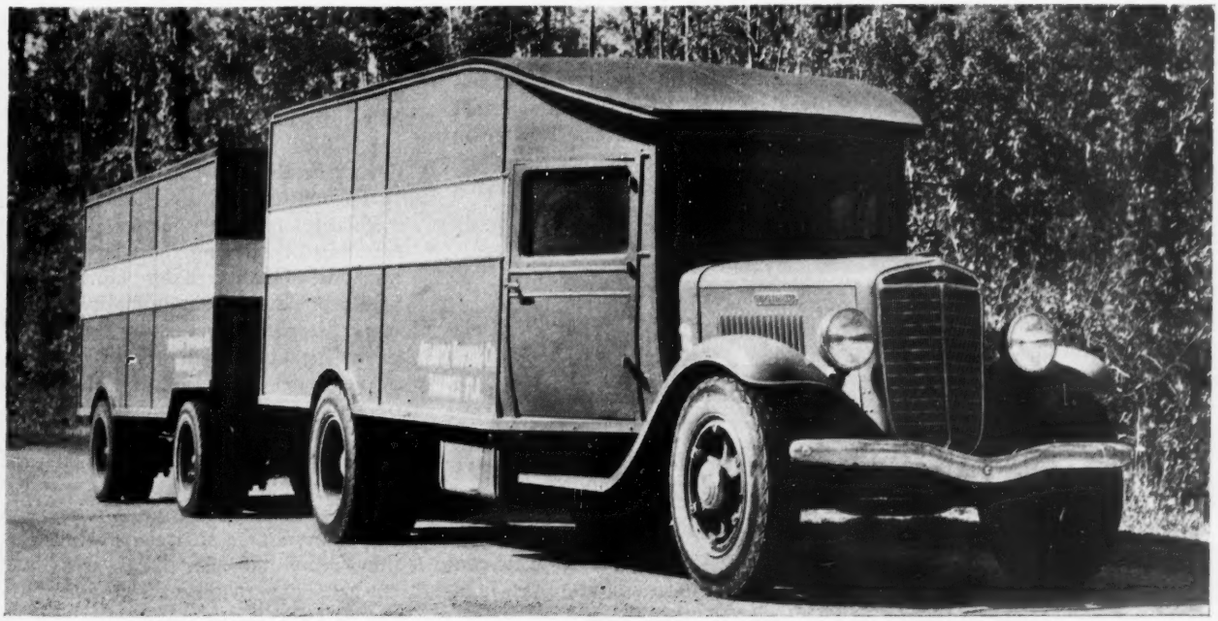
Tractor-Trailer Units Move Fruits to Market

HOWEY - IN - THE - HILLS, Orange County, Florida, is in one of the most important citrus-fruit-producing areas of the state. Last year the equivalent of 10,599 carloads of fruits and vegetables were shipped out of the area.

Its products include oranges, grapefruits and tangerines in addition to such staples as lettuce, tomatoes, cabbages, beans, peppers, celery, watermelons, strawberries and egg-plants. The great majority of these products move at least part way to market on motor trucks.

In Howey-in-the-Hills, which is about 35 miles northwest of Orlando, one of the principal growers is the Vaughan-Griffin Packing Co. It operates the Atlantic Trucking Co. which in turn employs a fleet of five International trucks, each hauling a four-wheeled trailer.

One of the units shown on this page carries a total of 250 boxes of fruit. It makes the 178-mile run between Howey and the port of Jacksonville in between five and six hours.



This International with its four-wheeled trailer is carrying 250 boxes of citrus fruit from Howey-in-the-Hills to the port of Jacksonville, Florida. From there the fruits go by boat to Atlantic coast ports and to foreign countries. The 178-mile run from Howey to Jacksonville is made in from five to six hours.

New DISCOVERIES AND INVENTIONS

FOOD ENGINEERING

Corrosion of Metals By Juices, Musts and Wines

VERY FEW METALS are resistant to corrosion under all conditions existing in a winery. In choosing a metal, therefore, the only safe criterion for selection is a test conducted in the winery *at the place where the metal is to be used.* Although the safest procedure is to use the most resistant metal indicated by such tests, it is not always the most feasible method. In many instances it is possible to use the less resistant metals in the winery provided they are used where they come in contact with the juices and wines during the early stage of manufacture. This is possible because much of the iron content of musts is lost during fermentation, and the copper is deposited during fermentation and storage.

Reasonably resistant metals are safe to use during crushing and fermentation, but only the most resistant metals should be used in contact with stored and finished wines.

Corrosion is greatest at the crushers, due to greater aeration, rigidity of flow and freshness of juice. Metals having greatest resistance here were stainless steels, Cupro-nickel and Inconel. Least resistant were: cast iron, steel, tin, Niresist and nickel. At the the filter charger, corrosion was also considerable, due to agitation, erosion and aeration. Again the stainless steels and Inconel were most resistant. In all, 46 different metals and alloys were tested. The order of resistance changes under different conditions, and a metal best suited for the crusher would not necessarily give best results for the finished dry wine.

Digest from "Corrosion of Metals by Musts and Wines," by Mrak, Caudron and Cash, *Food Research*, 2, 439, 1937.

How to Select the Right Dryer

IN SELECTING A DRYER for a given job, due attention must be given to sensitivity (as to heat or oxidation) and other factors which may call for special treatment. For extracts, which are likely to be exceptionally sensitive, the mild conditions of vacuum drying are preferable. For pastes and suspensions a tray dryer or a two-roll dryer may be used, according to whether batch or continuous operation is desired. In cases of oxygen-sensitive products the drying chamber may be filled with nitrogen or other inert gas and heated entirely by radiant heat.

For less sensitive materials *pulsation drying* is useful. This system is the opposite of vacuum drying in that excess pressure is applied, but the pressure is intermittent. Advantages are increased rate of drying for a given temperature, and a favorable heat balance. The latter is more or less offset by higher power consumption. For thin, mobile liquids containing solid particles the choice lies between spray and roll drying for continuous operation, and between different tray systems for batch drying. In this case a single-roll, not a two-roll, dryer is employed, and the roll may be partially immersed in the liquid.

When chemical or physical modification of the properties of a product must be effected by heat, or when the material is liable to spoilage by water, counter-current drying is preferable to direct flow systems even though less economical and not permitting such high initial temperatures. For grain and other granular materials, which do not make dust, continuous drying in a revolving drum is an efficient method.

Digest from "Choice of Dryers," by F. A. M. Wülfinghoff, *Archiv fur Wärmewirtschaft*, 18, 336, 1937. (Published in Germany.)

METHODS OF PRESERVATION

Control of Molds on Foods With Acetic and Fatty Acids

EXHAUSTIVE TESTS carried out at the Fleischmann Laboratories indicate conclusively that acetic and other innocous fatty acids of this series have remarkable toxic effect upon the growth of bread molds. This, however, is the case only at low pH values. At high pH values, 5.5 to 6, these acids have only a slight effect. The effect of acetic acid is decidedly specific. Fatty acids—acetic, propionic and the butyrics—are more toxic to molds than mineral acids or such organic acids as lactic, citric, tartaric and maleic.

A very effective method of preventing mold development consists of applying a film of dilute acetic acid (vinegar) to the surface of a loaf of bread.

It is believed that this principle may be applied to other than food and bakery products.

Digest from "Further Studies in the Growth of Bread Molds as Influenced by Acidity," by Kirby, Atkin and Frey, *Cereal Chemistry*, 14, 865, 1937.

Preserving and Storing Eggs

SINCE OVER HALF the egg production in the United States occurs between March and June, about one-fifth of the total annual lay is stored in the shell or the egg contents are dried or frozen.

Whites are unaffected by freezing, but yolks, and hence whole eggs, are changed. The freezing point of yolks may be lowered by adding glycerine, sugars, or salt, thus permitting lower storage temperatures. Drying is carried out on tray or belt tunnel-driers or by the spray system. For dried whites, to whip when reconstituted, the original whites must be fermented before drying or the dried material aged for some months.

Quality of eggs is better judged by candling or opening than by chemical methods. Quality after storage depends on the original quality of the eggs, sterilty, preventing microbial growth on the shell, pH of contents, preventing evaporation and absorption of flavors, and on temperature. The three usual methods are immersion in water glass, oiling the shell and ordinary cold storage.

Hens usually lay good eggs but they may not be so fresh by the time they reach storage. Dirty eggs and washed eggs readily admit germ life through the larger pores of the shell. Storage flavor is often due to the type of fillers and flats used in the crates and is increased by high hu-

midities. With modern odorless packing materials, high humidities, around 90 per cent, are preferred to prevent evaporation. Air circulation should be slow, for rapid circulation offers no advantages. The most popular and cheapest method for coating the shell is oil treatment. For short storage periods moisture-proof case liners may be used, but these favor mold growth. In some parts of Europe, sealed containers of inert gas, nitrogen or carbon dioxide, are used, these preventing molds.

Digest from "Preservation and Storage of Hens' Eggs," by Paul F. Sharp, *Food Research*, 2, 477, 1937.

BAKERY PRODUCTS

White vs. Whole-wheat Bread

IN PASSING FROM WHITE BREAD to whole-wheat bread, the dietary benefit is less than is popularly supposed, and is actually accompanied by certain alimentary losses. True, whole-wheat bread is slightly richer in phosphorus, but since the phosphorus intake is in no danger of being deficient with white bread in the diet, the difference is not significant. Again, in the matter of vitamin content, persons on a general diet will experience no significant benefit from whole wheat as compared with white bread. These conclusions are based on chemical and dietary studies of the so-called 70, 75 and 80 per cent wheat flours. The importance of the germ in the wheat grain is greater than its small size (about 1.5 per cent, of the weight of the grain) would indicate. Unfortunately, flour cannot be milled and sold in the usual way with the germ left in, because it will make the flour rancid—hence modern milling takes out the germ. Only flour made for bakeries and used promptly after milling can retain the germ. Even then, if opportunity is given for the enzymes of the germ to exert their influence, the quality of the bread suffers, especially in loss of digestibility and food value. In general, it may be said that the public preference for white bread is sound and wholesome and should not be discouraged.

Digest from "Alimentary Quality of White Bread," by E. Fleurent, *Chimie et Industrie*, 38, 419, 1937. (Published in France.)

BEVERAGES

Effects of Metals on Wines

MOST METALS, when added to California sauterne- and claret-type wines in soluble form, in concentrations up to 50 parts per million, caused turbidity sooner or later. They also brought about changes in bouquet, usually with the development of an aldehyde odor. Nickel, chromium, zinc, and to some extent tin, did not cause turbidity.

Metal alloy turnings were added to wine and this stored for four weeks at room temperature. Duriron, Durimetal, Inconel, Allegheny C, aluminum-bronze, Monel metal and cleaned copper caused no change in appearance or bouquet in this time. Uncleaned copper caused decided turbidity. There was very slight turbidity with manganese-bronze, phosphorus-bronze, machine brass, Waukesha alloy and cupro-nickel. Decided turbidity occurred with tin, pure aluminum, aluminum 76, aluminum 12, cast iron, and steel, all except the pure aluminum also producing hydrogen sulphide. Aluminum and manganese-bronze bleached claret wine, while tin darkened the sauternes.

Digest from "Effects of Certain Metals and Alloys on Claret- and Sauterne-type Wines Made from Vinifera Grapes," by Mrak, Cash and Caudron, *Food Research*, 2, 539, 1937.

Bacteria Withstand 22 Per cent Alcohol

UNIDENTIFIED BACTERIA which have tolerance for alcohol of 22 per cent by volume have been found to be the cause of spoilage of fortified sweet wines, such as muscatel, angelica, sherry, port, tokay and malaga. But that has not occurred in dry wines. The flavor is not seriously impaired but the "diseased" wine is unsightly. Pure cultures of the organism resemble a tangled mass of wet hair.

Sulphur dioxide in 60 parts per million will prevent this spoilage; so will 0.5 gram of citric acid per 100 cc. The spoilage organism is easily killed by heat.

Digest from "Characteristics of an Organism Causing Spoilage in Fortified Sweet Wines," by Douglas and McClung. *Food Research* 2, 471, 1937.

CANNING & PRESERVING

Clarifying Extracts

AN AGENT for clarifying and brightening cloudy fruit juices, extracts and other liquid preparations is obtained by mixing a protein degradation product (one which is soluble in cold water) with an enzyme. As the invention is described in German Patent 650,098 (granted Sept. 15, 1937, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-Main) the preferred enzymes are pectolytic, diastatic and proteolytic, i.e., those which ferment pectins, starches and proteins. For example, an inexpensive and effective clarifying agent is made by swelling sheet gelatin in an equal weight of water (acidified with 1 per cent of concentrated hydrochloric acid) for one hour, heating in an autoclave two hours at 130 deg. C. (266 deg. F.), pouring on glass plates and drying. This degraded gelatin is soluble in cold water. It is powdered and mixed with five times its weight of an enzyme preparation made from one of the common molds, such as *Aspergillus oryzae* or *Penicillium glaucum*.

FATS & OILS

Synthetic Fat From Sugar

A PROCESS which was patented in Germany about a year ago by Karl Lüdecke of Berlin-Dahlem (German Patent 647,219) has received careful study. As a new method in chemical catalysis and as a synthesis of fats heretofore formed only in nature, the new process opens wide the gate to a new field in the chemistry of fats. Oil seeds are used in the synthesis to provide the impetus which puts nature to work synthesizing more fat than the seeds contain. The sugar, which is the actual raw material, may be a cheap product such as molasses, or sugar made by the acid hydrolysis of wood or starch may be used.

To increase the fat content of the mixture at the expense of the sugar content, an oil seed (such as flax seed) is allowed to stand 27 days with a solution of cane sugar at 37 deg. C. (98.6 deg. F.) in a thermostat. At the end of this time the fat-content has increased considerably. It is probable that the fat, already present in the oil seed, acts as an organic catalyst to accelerate the synthesis, but an inorganic catalyst such as magnesium sulfate is also very helpful. Proteins in the seeds may also take part in the reaction.

It is not yet known whether the synthesized fat is the same as that contained in the oil seeds, or different. For the present the greatest utility of the new process would seem to lie in fat enrichment of seeds and fruits rather than in preparing fats and isolating them as such.

Digest from "An Interesting Synthesis of Fats," by W. O., *Seifensieder-Zeitung* 65, 19, 1938. (Published in Germany.)

Emulsifying Agents for Margarine and Shortenings

AN IMPROVEMENT in margarine manufacture consists in using as emulsifying agents the esters of higher fatty acids with polyhydric alcohols having at least one free (unesterified) alcoholic hydroxyl group. As these emulsifying agents are described in British Patent 474717 (granted Dec. 2, 1937, to Herbert Schou of Juelsminde, Den-

mark), the fatty acids from which the esters are formed are at least as high in the series as caprylic acid, and a polymerized or oxidized fatty acid radical is one of the ester components. The polyhydric alcohol may be glycerol or glycol, or one of the sugar alcohols such as mannitol or sorbitol. For example, margarine is made by dispersing 200 parts of sour skim milk in 1,000 parts of a molten mixture of cottonseed and coconut oils with the aid of 5 to 15 parts of an emulsifying agent of the specified type. These agents can also be used for making other water-in-oil emulsions, such as shortenings for use in bakeries. Cake batters are also improved by a small addition of one of these emulsifying agents. Emulsions prepared in this way can be mixed with coloring matter, salt or other desired ingredients at any stage in the process.

MEATS & FISH

Hormones and Vitamins From Whales

THE NEW German whaling fleet is expected to bring in sufficient whales annually to supply all the livers needed by makers of vitamin A concentrates. This takes into account the probable demand for vitamin enrichment of margarine as well as the production of vitamin-A preparations to be used as such. But whale livers, like fish livers, are sensitive and soon lose much of their vitamin potency if not properly preserved. Refrigeration is not sufficient, but salting is effective. There are also preservatives which are effective at much lower concentrations and can be used instead of salt.

Whale livers weigh about 1,300 lb. on the average and yield 1 to 2 per cent of oil with high vitamin-A content. Sometimes the yield of oil is as high as 4 per cent. There is much to be learned yet about the influence of sex and age in whales, and of the season and climate, on the yield and quality of the liver oil. Another possibility for obtaining useful products from whale glands is the production of hormones from the pituitary, ovaries, testes and other glands. Here again the potential supply is considered sufficient for the German market and even for export. As with the liver, so even more with the smaller glands, proper preservation is essential for successful production of the hormones. Acetone and formaldehyde are among the preferred preservatives.

Digest from "Whale Organs as Raw Materials for Hormones and Vitamins," by C. Bomskov and F. Unger, *Fette und Seifen*, 45, 90, 1938. (Published in Germany.)

MISCELLANEOUS

Coenzymes

ORIGINALLY NAMED COENZYMES because they were thought to be accessory substances in enzyme systems, the substances which accompany and aid enzymes in nature have revealed themselves in recent investigations as leaders and prime movers in important bio-chemical reactions. The first one was discovered in 1905 in the liquor from compressed yeast, and many observations since that time have brought much new information to light in problems of metabolism, nutrition and related biochemical fields. It is no longer sufficient to speak of an enzyme; the system as a whole is now known as a *holenzyme*, with active components called *coenzyme* and *apoenzyme*. The relation between coenzymes and vitamins is so close that two coenzymes (lactoflavin and aneurin) are known also to be vitamins. Similarly, there is a close relation to the hormones. The study of coenzymes is only beginning, and it may be expected that much information about vitamins and their true functions in the diet will be obtained from future research in this field.

Digest from "Coenzymes," by H. von Euler, *Angewandte Chemie*, 50, 831, 1937. (Published in Germany.)

The Place of Salt in the Diet

TABLE SALT has certain definite functions and effects in the diet, and a salt deficiency has well defined results. These include a dehydrating effect (diuresis and loss of weight), discharge of kidney and circulatory functions, and some special effects which are favorable in certain diseases and can be utilized medicinally. The fact that physicians sometimes prescribe a low-salt or salt-free diet, for the sake of desired therapeutic effects, has led to exploitation of salt substitutes.

Some makers of saltless condiments have even advertised that salt is harmful to healthy persons. As a matter of fact there is a place for salt substitutes, but they should be employed only under medical advice. Not only are they not needed by healthy individuals, but they may lead to a salt deficiency which is itself harmful. For patients needing a diet without salt, skilled cooks and dietitians can arrange menus which will be both safe and palatable, using only common condiments and foods which need no condiment, without resorting to any special salt-free preparations. The need for competent medical control of salt-free diets is illustrated by the occasional results of excessive abstinence from salt, two of the most serious being the circulatory disturbances known as thrombosis and embolism.

As a problem in metabolism, it is probable that the sodium-calcium balance must not be shifted too far by depriving the body of sodium. As a problem of diet, the situation is another instance of the dangers of excess in either direction. Sodium chloride is not lightly to be discarded as a food factor.

Digest from "Applied Food Chemistry in Dietetics: The Salt Problem," by H. Dibold and F. W. Lapp, *Oesterreichische Chemiker-Zeitung* 40, 514, 1937. (Published in Austria.)

Flour in Electric Dry Cells

AN INSTANCE of the diversion of a food product to an industrial use is the manufacture of electric dry cells, in which wheat flour has certain points of superiority over cheaper starchy materials. The gluten has an important influence on paste-forming quality.

One of the principal difficulties, with wheat flour as with all other starchy materials, is variability in pasting quality, viscosity and other properties. Uniformity cannot be expected in the natural product and due allowance must be made, e.g., by heat treatment to adjust viscosity to the desired level, or by compounding with other materials to enhance or moderate variable properties. Compounding with other materials has the added advantage of economy, since wheat flour is relatively expensive, and may be resorted to for that reason alone when quality is not sacrificed.

There is some evidence that low grade wheat, which is unsuitable for baking, yields flour with exceptional water absorption capacity, thus making savings in high grade wheat. Soy bean flour and corn meal can also be blended with wheat flour. As another means of saving wheat, a dry heat treatment can be employed which raises the viscosity of the starch suspension and thus lessens the quantity required.

Digest from "Flour Consumption in Dry Cell Manufacture," by H. Haevecker, *Chemiker-Zeitung* 61, 927, 1937. (Published in Germany.)

Bactericidal Effects Of Onion Vapors

FRESHLY GROUND ONIONS emit vapors which have a bactericidal effect. This effect is not as strong as that of garlic vapors, and is more quickly exhausted. The onion, for instance, loses considerable vapor in ten minutes. The emissions from onion increase with the temperature from 10 deg. C to 37 deg. C.

Digest from "Bactericidal Effects on Onion Vapors," by T. H. Lovell, *Food Research*, 2, 435, 1937.

The PLANT NOTEBOOK

Conveying Packages Between Floors

With the storage warehouse on the second floor, and the first floor devoted to an active retail trade, the sales department of the Miller Groceteria, in Denver, Colorado, found themselves handicapped by the difficulty of getting material quickly from the storeroom to the retail floor. In addition, there was the problem of getting unsold material back to the storage room, as well as taking the supplies from the receiving door up to the second floor storeroom.

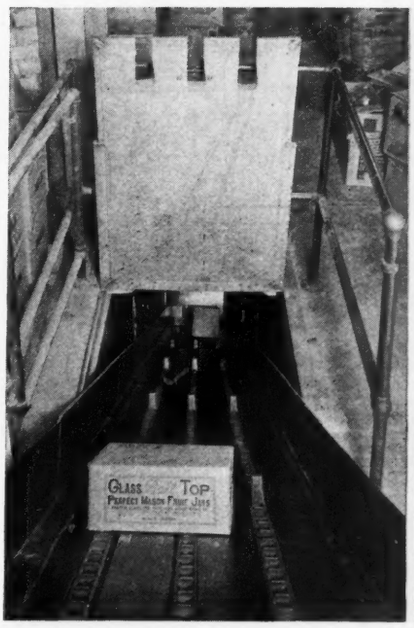
A straight gravity chute, 30 in. in width, from the second floor to the first, which was first used had two definite drawbacks. Packages moved too fast or too slowly on it, frequently with damage to some of the products. Also, it could not take material up to the storeroom, thus causing delay and extra handling expense.

The illustrations show how the problem was satisfactorily solved. A conveyor was installed in the existing chute, with the addition of a curved receiving point at the upper end and a curved discharging platform at the bottom. The new conveyor not only carries packages down, but takes them up as well. It is operated by a 1½-hp. motor-driven reducer which can be run in either direction. Breakage has been eliminated since packages no longer collide with each other at the foot of the chute.

The installation consists of three parallel strands of detachable link belt chain with package pushing or retarding attachment links spaced every 5 ft. The carrying chute was lined with maple with grooves left in it for the travel of the conveyor chain. These grooves were fitted with renewable steel slides. Specially built deep-grooved supporting idlers make it possible for the return of conveyor chains to clear adjacent floor beams.

The drive is very compact, the motorized speed reducer and roller chain drive being confined within the width of the conveyor chute, closed on both sides so that it cannot be seen or reached except by intent. The conveyor chains are operated at the speed of 60 ft. per minute.

In operation in two of Miller's Denver stores, such conveyors have proved very satisfactory. — FRANK CONLY, *Denver, Colo.*



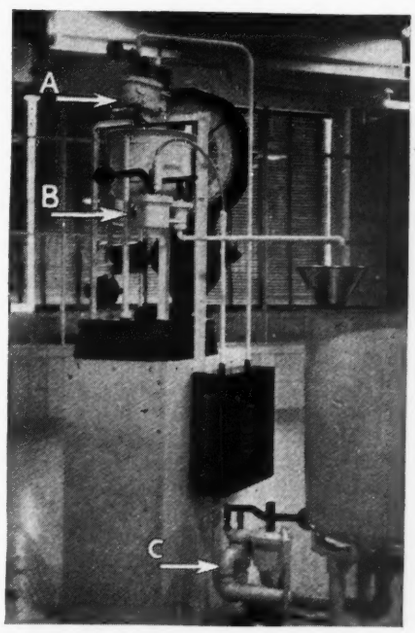
Packages pass up or down the chute on the triple-strand chain conveyor which can be operated in either direction.

The conveyor discharges onto a curved metal receiving platform on the lower floor.

Control Duplicates Product

In a plant recently built in Illinois, batching operations in the manufacturing of a liquid ingredient are automatically controlled so that each batch is the duplicate of every other batch.

Referring to the accompanying photograph, the basic liquid is piped from storage to the solenoid valve *A*, which controls the flow into the small hopper on the scales. A photoelectric cell is operated by the scale beam and sends the electric impulse to close the solenoid supply valve when the predetermined quantity of liquid has flowed into the scale hopper.



Automatic control for batch mixer.

By an electrical interlocking system, the closing of the solenoid valve *A* opens a second solenoid valve *B*, allowing the liquid to drain into the mixing tank. When the small hopper is emptied, the scale beam operates another photoelectric cell which causes the solenoid valve *B* to close. This last operation also starts the propeller type mixer in the mixing tank, and mixing continues for an electrically-timed period. At the end of this period, contact is made with a third solenoid *C*, which opens and allows the liquid to flow out of the mixing tank.

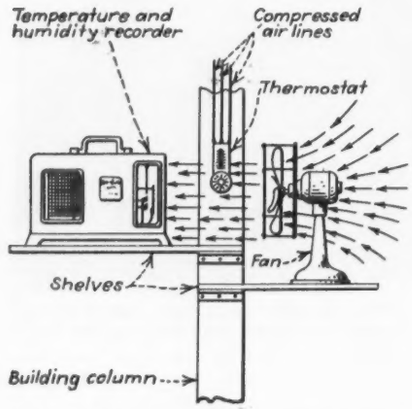
In another department of this plant, six units similar to that described above are mounted on a large turntable which revolves past a series of hoppers. Each hopper delivers the correct amount to the individual batch mixers. The operation of the whole six is controlled in the same way by photoelectric cells.

Automatic control of this type completely removes the chance for human

error. In this way the proportioning of the ingredients in each batch is always the same.

Fan Improves Operation of Air Conditioner Controls

The proper functioning of instruments used to control or record the temperature and humidity of air-conditioned areas depends largely upon their location. This equipment should be installed where it is free from localized heat emission and in a region where stratification of air currents is prevented by free circulation. Selection is particularly complicated where there are large quantities of heat radiated into the room and is best determined by comprehensive check of the conditioned space with a sling psychrometer.

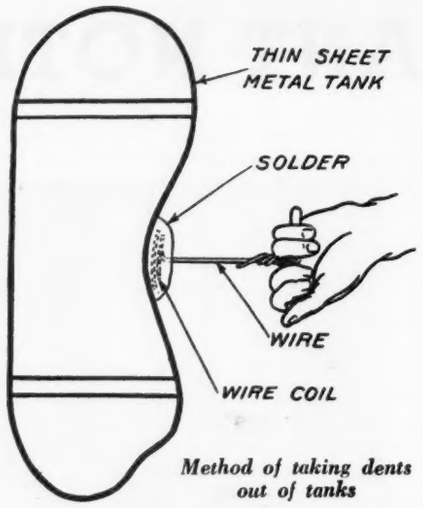


A fan, placed in this manner, improves the operation of air-conditioning controls.

In some instances, where there is doubt of proper circulation around an available location, this condition can be remedied by producing artificial circulation with a fan, as shown in the sketch. The temperature rise in the circulated air is negligible and can be compensated for at the instrument. Forcing circulation in this manner will generally result in more uniform conditions of temperature and humidity as the air handled by the fan is a composite mixture drawn from a relatively large space—S. H. COLEMAN, *Roanoke, Va.*

To Straighten Tanks

The accompanying sketch shows a method that may be used successfully in straightening thin, dented or collapsed tanks. If a straightening rod can be used on the inside for reaching the dented spots, or if it is practicable to apply internal water or other pressure for forcing out the dents, this method may require more time and is not recommended. But there sometimes is no other method.



Method of taking dents out of tanks

Proceed as follows: Make a coil on the end of a wire similar to that shown in the sketch and solder it onto the tank at the dented place. When solidly attached pull with one hand and pound around the outside of the dent with a hammer with the other hand simultaneously. The dent will usually come out without any difficulty.

After straightening, the solder is easily melted off and the same process is quickly shifted to the next dent, if there is another.—W. F. SCHAPHORST, *Newark, N.J.*

Hot Water Storage Cuts Costs

Hot water can often be used in plant operation as a means of storing heat. Large power plants have found it a paying proposition to store hot water under high pressure. The smallest boiler room may profit from storing hot water under atmospheric pressure. In some cases, a heavy investment in additional boiler capacity has been avoided by the installation of an inexpensive hot water tank. In other cases, a reduction in the fuel bill has been brought about by this means.

The justification for hot water storage lies in the variation in heat requirements during the different parts of the working day. Assume the following case, by way of example. A plant has installed, among other things, a 100 horsepower boiler and a 10,000 lb. per hour hot water heater. The boiler is operated 24 hours each day. Difficulty is experienced in maintaining its steam pressure because of the heavy and variable load.

Suppose the night load is only 50 hp., which is only half the boiler rating. During the day the steam requirements call for an average of 150 hp., which means that the boiler must be forced to 50 per cent above its rated capacity. There is a waste of fuel during the night because of underload and a greater waste during the day because of the overload. Also during the day the hot water requirements are 10,000 lb. per hour and this alone calls for close to 50 hp. in order to heat the water from 40 to 180 deg.

The most economical solution to this problem is found to be the installation of 100,000 lb. of hot water storage capacity. The water is heated during the night while during the day the water heater is not used. This makes possible the operation of the boiler at a uniform load of normal rating throughout the 24 hours. The boiler efficiency will be improved and the fuel bill will be reduced. Any failure in steam pressure will be avoided and the boiler can be operated with less effort on the part of the fireman. Since the water is to be stored at atmospheric pressure, the reservoir can be made of wood, concrete or steel, depending on cost.—N. T. PEF. *Chicago, Ill.*

Transfer of Liquids by Air

The use of compressed air as a means of transferring liquids has received much attention of late years, and is widely used in the handling of milk. It is of especial benefit where the product handled is one which suffers in any measure from churning action such as produced by pumping. Without question, coming years will see more milk handled in this way than by pumps. It is hard to say to what extent it may be practiced with other materials. In the transfer of milk from one tank to another, or from delivery trucks to industrial tanks, a compressed air line is connected to the top of the tank from which the milk will be moved. The milk line enters the tank or equipment into which the milk will be received at or near the bottom. Thus, the material is moved by pressure exerted in the open space at the top of the tank and with the absolute minimum of agitation.

It goes without saying that compressed air used for purposes such as this must be pure and clean. Therefore, the use of oil and water separators in the air lines, and the use of proper filters on the compressor air intakes used for the purpose, are highly important, and must not be overlooked. Such apparatus, however, is readily available, because air which is used for various other purposes must be clean, So the clean air problem is one which has been solved quite satisfactorily. It only remains to use the equipment which is at hand.— JOHN E. HYLER, *Peoria, Ill.*

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Dust Collector

WESTINGHOUSE ELECTRIC & MANUFACTURING Co., East Pittsburgh, Pa., has developed a new device for the electrostatic precipitation of dust, known as the "Precipitron." This is a prefabricated design, which does not need to be tailor-made to suit each application. It is aimed at filling the gap between elaborate dust collectors of the Cottrell electric precipitation type and the more simple mechanical filter types, both in the range of service and first cost.

The "Precipitron" consists of three parts: An ionizing unit, a collector cell, and a power pack. The latter transforms the ordinary 110-volt, 60-cycle, single-phase current to a current suitable to operate the collector.

Units are made in capacities of 375, 550 and 750 cu.ft. of air per minute. These units can be grouped for larger capacity requirements.

It is expected that, among other uses, this new device will serve to remove mold spores and dust from bread coolers and other similar food equipment. In general, it will serve to clean the air used for circulation in air-conditioning installations.

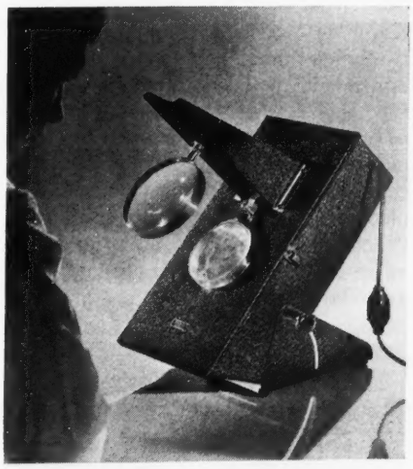
One Piece Stainless Steel Spinnings

CRAFT MFG. Co., 1512 N. Fremont St., Chicago, Ill., announces the successful development of large one-piece spinnings of stainless steel. These are particularly adapted for use in the food industry as tanks and covers for filling machines, hoppers, tank heads, floats, and steam jacketed kettle spinnings.

These one piece spinnings have the advantage of having no seams or joints to clean and sterilize.

Colony Counter

FOR THOSE whose work in bacteriology laboratories of the food industry requires the counting of colonies of bacteria, Spencer Lens Co., Buffalo, N. Y., has brought out the Quebec Colony Counter. In this device, the illuminant is so placed that light cannot glare into the eyes of the observer, but passes obliquely through the colonies so that they glow as brilliant spots or points against a dark background, increasing the contrast between colonies and culture medium, and making very small colonies visible. The rulings appear white against the dark background, contributing to ease in making counts. A magnifying lens 4½ in. in diameter is held in an adjustable mount.



Device for counting colonies of bacteria.

Saw-Tooth Crusher

SPROUT, WALDRON & Co., INC., Muncy, Pa., has developed a new type of saw-tooth crusher with a drop-side construction to facilitate cleaning. These sides are made of heavy plate and attached by hinges. By loosening two wing nut clamps, a side can be pulled open, exposing the two crushing rolls.

The machine is furnished with either roller bearings or plain bearings. Crushing rolls can be 10 to 25 in. long. The machine will handle material up to 6 in. in thickness. Rolls are equipped with saw-tooth disks of hardened steel, mounted on square shafts. Eight and sixteen point disks are available. With eight point disks, the crusher produces a product about 1½ in. thick, and with sixteen point disks, a ¾ in. thick product.

Ice Cream Cabinets

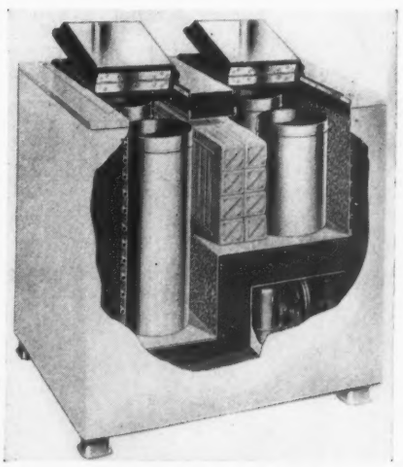
THREE NEW TYPES of ice cream cabinets have been introduced by Frigidaire Division, General Motors Sales Corp., Dayton, Ohio. These types include utility, portable and "remote" models.

The utility models are designed for permanent installation and have the following capacities: 2-2½ gal. containers; 2-2½ and 1-5 gal. containers, 2-2½ and 2-5 gal. containers; and 2-2½ and 4-5 gal. containers.

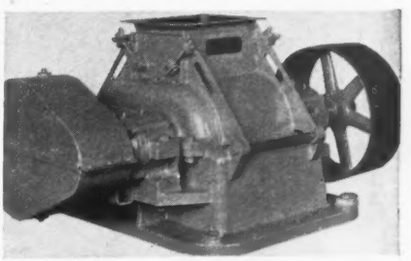
The portable cabinets range from 10 to 50 gal. capacities, with two different temperatures provided in the larger models.

Both of the above types are complete, with refrigerating compressors.

The remote models are for use where the refrigerating apparatus is installed away from the cabinet and come in larger size, up to installations



Construction of new Frigidaire ice cream cabinets.



Saw-tooth crusher with drop sides

where three twelve-hole cabinets are required.

All cabinets have 4 in. of corkboard insulation, flip-flop type lids, and white enameled exteriors.

Elbow Propeller Type Pumps

WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J., has brought out a line of elbow propeller type circulating pumps to handle water and semi-viscous liquids such as sugar juices. These pumps are designed for installation in pipe lines for booster or circulating service. The small number of vanes and large openings provide a large streamline flow channel. Internal bearings and ball-type thrust bearings are provided. Any type of drive may be employed. Capacities range from 1,000 to 2,000 gal. per minute, at heads up to 20 ft.

Filter

AMERICAN SEITZ FILTER CORP., 480 Lexington Ave., New York, N. Y., has developed a filter called the "Tank Hercules" which is said to give finer filtration, have larger output, be simpler to operate and effect a lower per gallon cost of filtrate. It is claimed that the new filter obtains a crystal clear filtrate with practically no preliminary run, because the filtering medium sets immediately. Also, the filtering medium can be chosen to suit the requirements of the liquid, making for highest output and best filtering results.

This filter is made of steel, with screen frames of tinned bronze, screen of Monel metal, and fittings of tinned bronze or tinned iron. Where desired, other suitable metals can be specified. A feature is the eccentric locking device, by means of which the door can be opened or closed quickly and positively by a half-turn of the control wheel and lever.

Conveyor Belting

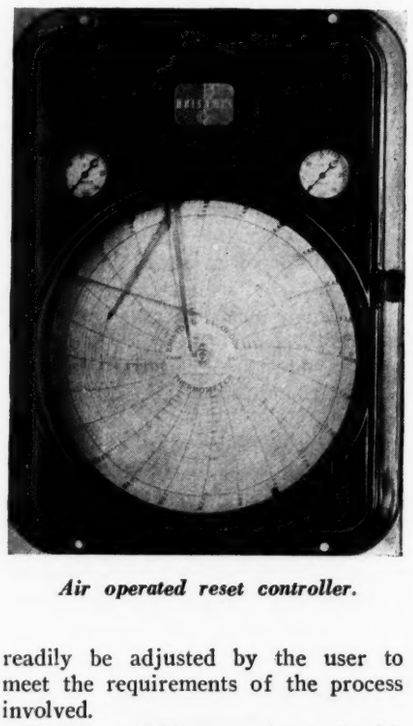
B. F. GOODRICH CO., Akron, Ohio, has developed a new conveyor belting featuring cord construction, for which is claimed longer wear than is obtained with belts of the fabric-carcass type. This belt is made up of plies of weftless cords, such as are used in modern heavy-duty truck tires. As a result, every tension member is completely surrounded and insulated with rubber. As the cords have no transverse or filler threads to obstruct their freedom of movement, they are free to distort themselves. This action supplements the cushioning qualities of the cover, giving increased resistance to impact, cutting and gouging.

Arrangement of parallel cords in the carcass of the Goodrich cord conveyor belt.

Among the advantages claimed for this cord conveyor belting are great transverse and longitudinal flexibility and greater resistance to moisture and acid penetration. This belting is available in any length, width and number of plies.

Reset Controller

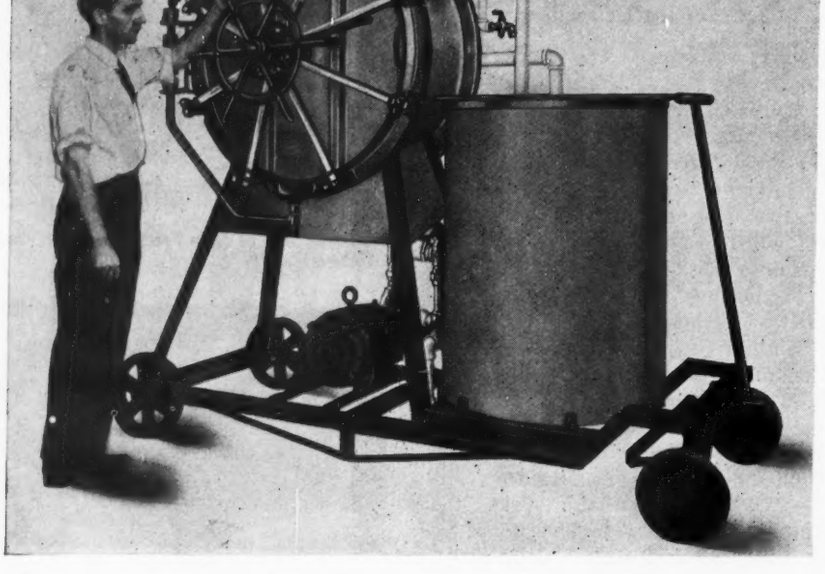
A NEW CONTROL INSTRUMENT, with wide throttling range and automatic reset that provides for point control, has been brought out by the Bristol Co., Waterbury, Conn. The device that provides for these features can readily be adjusted by the user to meet the requirements of the process involved.



Air operated reset controller.

These controllers can be used with various continuous processes, for the control of such variables as temperature, pressure, vacuum, flow and level. An example of their use is in temperature control when there are differences in respect to the time required for a change of temperature in the system, when the cooling or heating medium is added through the control valve.

With these controllers, any load change accompanied by a movement of the pen away from the control point produces a change in the controlled air pressure of sufficient value to give the diaphragm control valve the required opening to bring the variable back to the control point. This change is obtained automatically at a rate that corresponds to that required by the process being controlled.



Seitz "Tank Hercules" filter.

News

General News—Business Trends—Men, Jobs and Companies

New Butter Standards Issued by Government

Revised quality standards for creamery butter became effective April 1. Issued by the Bureau of Agricultural Economics, the standards provide a more exact and simplified system of determining the official United States score of creamery butter. The range of score has been narrowed from the old basis of 75 to 95 points to a new base of 85 to 93 points. The package has been discontinued as a factor in determining the quality. Another change is in the discontinuance of the score-card method of prorating the score to various factors. A simple, definite and more direct method of rating each factor—flavor, body, color and salt—has been substituted. Each identified flavor in butter is assigned a definite rating based upon the extent or degree of its development. Each defect in body, color and salt is also rated. The final score is determined by the application of a general rule, as outlined in the printed regulations. The revised standards are tentative.

FTC Orders Millers To Cease and Desist

Eight California milling companies and their association, California Rice Industry, have been ordered by the Federal Trade Commission to cease fixing and maintaining uniform prices for rice grown in their state. And the FTC further directed them to stop determining processing quotas for millers. As a result of their pricing policies and other practices, the millers have acquired a monopoly in the sale of rice grown in California and have suppressed competition, the Commission charges.

Substantially all Japan type rice produced in the United States is grown in California and is milled and sold by the companies against which the FTC charges are directed. The average annual crop when processed is equivalent to one and a half million 100 lb. bags.

The companies named in the cease and desist order include Capital Rice Mills, C. E. Grosjean Rice Milling Co., Growers Rice Milling Co., Pacific Trading Co., Inc., and Rosenberg Brothers & Co., San Francisco; Woodland Rice Milling Co., Woodland; Phillips Milling Co., Sacramento; and Rice Growers Association of California, West Sacramento.

CONVENTIONS

MAY

9–11—American Spice Trade Association, New York.
12–13—Central Atlantic States Association of Dairy, Food and Drug Officials, Claridge Hotel, Atlantic City, N. J.
15–17—New England Bakers' Association, New Ocean House, Swampcott, Mass.
15–18—Southern Bakers' Association, Hotel De Soto, Savannah, Ga.
23–27—American Association of Cereal Chemists, Netherland Plaza Hotel, Cincinnati.
27–28—Rice Millers' Association, Galvez Hotel, Galveston, Texas.

JUNE

6– 7—Associated Grocery Manufacturers of America, the Homestead, Hot Springs, Va.
6–10—Association of Operative Millers, Hotel Nicollet, Minneapolis, Minn.
6–10—National Confectioners' Association, Waldorf-Astoria Hotel, New York.
14–17—American Dairy Science Association, Columbus, Ohio.
19–21—National Macaroni Manufacturers' Association, Edgewater Beach Hotel, Chicago, Ill.
21–24—Food Preservation Conference, Pennsylvania State College, State College, Pa.
23–24—American Fisheries Society, Battery Park Hotel, Asheville, N. C.

Syrup Process Improved

The use of malt to convert the starch in sorgo syrup to sugar and to prevent scorching and jellying has developed a new and improved method for the manufacture of sorgo syrup, according to the Bureau of Chemistry and Soils. Aside from the use of malt, the new process involves the addition of certain equipment to the ordinary sorghum-making plant.

Starch is one of the chief trouble makers in the production of sorghum molasses, and its conversion into sugar by the new process removes it as an obstacle in the process. To prevent sugaring in certain varieties of sorghum, the Bureau scientists have used invertase. The new method lays emphasis on straining and settling. The syrup produced by this procedure is reported lighter in color and clearer than the older type. The flavor also is reported to be milder.

Food Law May Pass During This Session

Once again the way has been paved for early enactment of that legislation perennial, the food and drug bill, now entering its fifth year before Congress. On April 14, the House Interstate Commerce Committee voted a favorable report on its version of the Copeland bill (S.5). And it was expected that the measure would pass the House with but little debate. What may happen then is a horse of two colors. The Senate has passed S.5, but there are differences between its version and that of the House. So there is a possibility that the Senate will never accept the House version, and there is another possibility that the differences will be ironed out in conference and the law enacted before Congress adjourned.

Wage Law Believed Blocked

Wage and hour legislation made a strong comeback on April 14, when the House Labor Committee favorably reported a bill providing for a 40-cent minimum wage to be attained in three years and a 40-hour maximum week to be realized in two years. But even with this impetus, defeat of the legislation is conceded by Administration leaders. The barrier is seen in political opposition arising from the same group that blocked the reorganization bill. Strong opposition from organized labor is not expected.

Fewer Can Sizes Proposed

It is proposed to reduce to seven the number of can sizes used for fruits, vegetables and milk in a bill introduced by Representative Sauthoff (H.R.6964). And in a move to avoid the establishment of unfortunate standards of dimension and capacity for these containers, National Canners' Association has enlisted the aid of the National Bureau of Standards. The Bureau, through questionnaires, is determining what can sizes are now used for each product, and hasty legislation limiting all can sizes to a particular number is not expected at this session of Congress. It is hoped that the canning industry will be able to effect a workable simplification without impairing development in new containers and new canned products.

New Uses for Dry Milk Reported at Convention

Several possible uses for dry milk solids were presented at the meeting of American Dry Milk Institute, Inc., in Chicago, April 7.

Dr. H. H. Mitchell, University of Illinois, reported findings of feeding tests in which experimental animals showed better growth in body length when fed on sausages containing milk solids than when fed only meat sausage. These studies give a basis for the claim that the legal restriction on the use of dry milk solids in sausages has no nutritional basis.

Mr. A. F. Pahlke, of the Institute, cited sausages containing 10 per cent milk solids as having improved keeping qualities over all-meat sausages. Research committee reports gave the water-absorption value of milk solids in sausages as 1:1; claimed satisfactory results with meat loaves containing up to 20 per cent, pork sausages from 10 to 20 per cent, and dry summer sausage with 8 per cent of dry milk solids. The committee recommended the use of 15 to 30 per cent of dry milk solids in cakes, 10 to 15 per cent in bread and 12½ per cent in Danish pastry, on a flour-content basis.

Conrad Spoehr, a confectionary specialist, discussed the possible increased use of dry milk solids in confectionery manufacture and exhibited a variety of chocolate-coated candies as supporting evidence of what can be done when one knows how. Among these confections were chocolate cream drops with 6 to 8 per cent dry-milk solids content, caramels with 16 to 23 per cent, fudge with 6 to 8 per cent, nougatines with 6 to 10 per cent, salt water kisses with 6 to 10 per cent, cocoanut centers with 15 to 25 per cent, and chocolate pastes with 8 to 10 per cent. Wholly new uses for dry milk solids in confections were given for marshmallows containing 15 to 25 per cent and for chocolate and caramel syrups containing 10 to 20 per cent.

Macaroni was among the possible new markets cited for milk solids.

Fruit-fly Eradication

To permit movement of grapefruit and oranges from areas under quarantine for the Mexican fruit fly, the Bureau of Entomology has prescribed conditions for satisfactory sterilization. One of the following prescribed treatments must be used:

1. Heating the fruit to 110 deg. F. or above (not to exceed 112 deg.) in the center of the fruit and holding it there for a period of 8 hours.

2. Heating the fruit for a period of not less than 14 hours, during which time the fruit shall be raised to a temperature of 110 deg. F. at the center and shall be maintained at or above that temperature for the last 6 hours of such treatment.

To prevent injury to the fruit, it is necessary to maintain a very high humidity throughout the treatment.

CAPITAL VIEWS

TAXES—New Taxes to pay the big bills for business aid will not be levied soon. The result will be a continued-deficit policy. The tax bill on which Congress labored during most of April is regarded as a business relief measure, not a new business-burden bill. In this particular, Congress had its way, despite the President's valiant effort to retain punitive or regulatory taxes on a large scale.

LEGISLATION—With the President's serious defeat by the Senate on taxes, and by the House on reorganization, the list of bills of general importance still to get attention became very short indeed. Adjournment will probably not come as early in May as confidently forecast in mid-April. But almost no bill is "must" when political fences back home need repair as badly as do those in almost every Congressman's district. Monopoly, patent restriction, wage-hour standards, national planning, and all the rest wither to minor importance under the heat of a primary campaign back home.

FOOD LAW—Prospects for enactment of the Copeland food and drug bill improved during April. But guessing the date of enactment is just as risky as it has been for several years past. The main obstacle continues to be the controversy as to whether the Federal Government will retain a sort of license supervision over new drugs. Other major controversies have been eliminated.

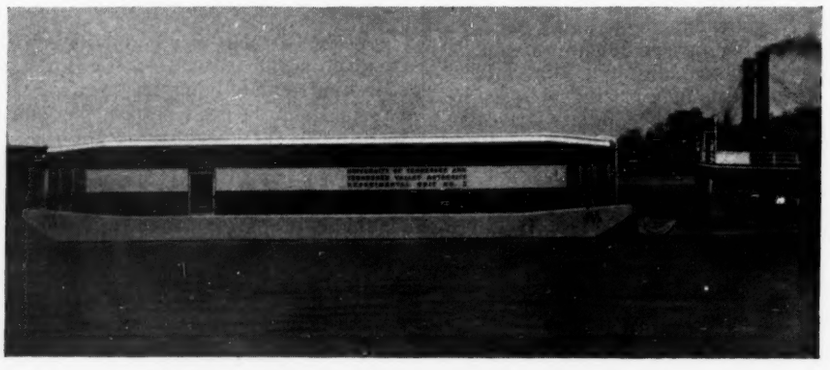
FEDERAL TRADE COMMISSION RULINGS—A. & P. has appealed the lower-court decision which supported the Federal Trade Commission cease and desist order issued under the Robinson-Patman Law. This means that it will be several months before any final decision can be had on the question of brokerage allowances from food manufacturers to chain distributors. In the meantime, FTC has started another case in which a large chemical distributor (it might just as well have been a food manufacturer was trying to use special wholesale agencies to which were granted special discounts of 5 to 15 per cent. FTC says this is a subterfuge because these dealers should not have any more favorable price schedules than do other wholesalers taking like amounts. Adjudication may define more fully the wholesaler function under the Robinson-Patman Act.

VITAMIN CLAIMS—Uncle Sam's supervisors of food and drug advertising are going to watch closely claims made regarding vitamin content of foods or the benefits of vitamins. Apparently, FTC intends to proceed against any companies making such claims whenever there is any ground for doubt as to the correctness of both the text and the implication. Food processors will have to study carefully all advertising copy from this point of view.

PROCESSING TAXES—One defeat in the Senate of the proposed food-processing taxes does not represent final elimination of this possibility. Some Senators who would like to have their agricultural constituencies see them vote for these taxes were opposed to putting them in as a part of the pending general tax bill when it was before the Senate in early April. When (and if) the question comes up again as an independent matter, there may be a generous majority in support in both Houses.

SILVER LINED CANS—With the decline in the price of silver, new uses have received special impetus. There is serious talk in Washington about a thin silver plate for food-can liners, supplementing or supplanting tin. Preliminary commercial trials look good, says the Bureau of Standards.

STANDARD FOOD GRADES—More accurate definition of quality grades is desirable on meats and other processed foods, argue the spokesmen of the Bureau of Agricultural Economics. They also quote "consumer awakening" as the basis for demanding that grading of butter, eggs, dressed poultry, canned goods, and other products be planned on an official basis. They still argue for the A, B, C system of grade labeling. It will not be surprising if soon the Department of Agriculture will be using the FTC policing authority as an argument for more grading by BAE. Bureaucracy?



TRAVELING WAREHOUSE FOR FROZEN FOODS

Refrigerator barge which will transport quick-frozen foods from points of production to points of consumption via inland waterways. Built to carry 350,000 lb. of frosted food, the barge is equipped with diesel-driven refrigerating machinery. To be operated experimentally by the University of Tennessee and the Tennessee Valley Authority, the river-going warehouse will receive its cargo in the TVA area and will take it to such possible destinations as Pittsburgh, Cincinnati, St. Louis, Milwaukee, Chicago and the entire Great Lakes area.

Frisco Fair Exhibits Planned by Industry

In the vast Hall of Foods, Beverages and Agriculture at the 1939 Golden Gate International Exposition on San Francisco Bay will be held food exhibits which promise to be the largest and most comprehensive ever seen on the Pacific Coast.

Although the opening of the $50,000,000 World's Fair of the West is still a year off, many firms have already signed contracts for exhibit space. Most recent of these are Armour & Co., National Biscuit Co. and California Walnut Growers' Association. Representing the majority of walnut growers in America, the growers' association will emphasize the importance of the industry in California, which produces 95 per cent of the nation's crop.

One of the most popular displays at the exposition promises to be an exhibition of quick-freezing processes.

An educational baking exhibit is planned in connection with Standard Brand's booth. All the different types of bread used throughout the world will be displayed. Models will be used to show how yeast grows and multiplies and how it is brought into concentrated form for distribution. Yeast as a source of vitamins will be illustrated with graphic displays.

Leslie Salt Co.'s exhibit will tell the whole story of processing solar salt. Models will show the manner in which tide lands are diked for evaporation, method of gathering the residue and the final purification by precipitation of all extraneous materials.

Lyons Magnus, Inc., will display glacé fruits, showing the operations of processing and packing. Tea Garden Products Co. will stress California preserved fruits.

Other well known food firms now planning displays include H. J. Heinz Co., A. Schilling & Co., the Junket Folks, A. Sensenbrenner Sons, Western Sugar Refinery and J. D. and A. B. Spreckels. In the beverage division, California Brewers' Association and Viticulture Industries, Inc., are planning elaborate displays in their own buildings.

Attention-getting displays are planned to impress the millions of visitors with the magnitude of the canning industry in California, which puts up nearly a third of the nation's total fruit and vegetable pack. These displays will illustrate various processes used in canning by means of models, pictorial effects and machines in actual operation.

An educational fruit display will serve to attract attention to methods of growing, handling, and preparing. Standards used in grading and the special varieties grown for their superior canning qualities will be explained.

The most modern methods of food preservation and the latest mechanical devices for picking, pitting, peeling, cooking and sterilizing all varieties of fruit will undoubtedly be exhibited. Latest developments taking place in the preparation and canning of juice will also be illustrated.

Motor Causes Explosion

Ignition of dust by a flash from an induction motor caused the explosion which killed five and injured seventeen in the Public Grain Elevator of New Orleans on April 4. Such is the finding of the Bureau of Chemistry and Soils. The explosion emphasizes, authorities say, the need for totally enclosed explosion-proof motors at all points in grain elevators and industrial plants where explosive dust clouds are created.

Process Keeps Fish Fresh

A new process for keeping fish fresh has been developed in Germany, according to a report by the American Consulate at Berlin, made public by the Department of Commerce. As soon as possible after landing, the cleaned fish are soaked in a highly diluted solution of 30 per cent hydrogen peroxide and immediately thereafter packed in ice in the shipping containers. Tests have shown that this process increases the resistance of the fish to bacteria, the fish remaining fresh for a period of from three to six days.

Makes Strawberry Syrup For Use in Beverages

Strawberry syrup for carbonated beverages can be manufactured at a cost of approximately 35 cents per gallon. This is the report of the Bureau of Chemistry and Soils, following extensive experiments at the Bureau's plant at Winter Haven, Fla. Berries too ripe for shipment, costing about $40 per ton, were used in the experiments.

The Bureau scientists made a syrup by crushing these berries, adding both cane and corn sugar, and filtering. Benzoate of soda was added as a preservative, since the product was stored without sterilization. Kept in unsealed containers at room temperature for one year, the syrup is said to have held all its distinctive strawberry aroma and taste. It was then used to manufacture a carbonated beverage by mixing one part of syrup with four parts of carbonated water.

After diluting with the water, time in storage becomes more of a factor than it is in the storage of the undiluted syrup, the product acquiring a musty taste after some months.

CONCENTRATES

• Deduction of insurance costs from rates paid motor carriers on meat cargoes is done in violation of the Motor Carrier Act, according to a decision by the Interstate Commerce Commission. . . . The reporting required by employers under the Social Security Act is simplified somewhat by a new form which combines tax returns and wage reports. . . . Vacations of one week with pay will be given the 2,500 employees of Curtiss Candy Co., Chicago, this year.

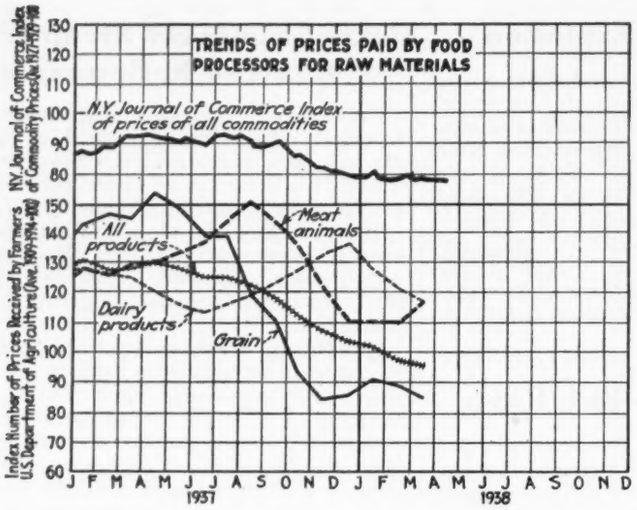
• *A trade-practice conference for the tomato-paste manufacturing industry will be held under the auspices of the Federal Trade Commission, at the Palace Hotel, San Francisco, May 5. . . . A one-semester pilot course in food technology has been inaugurated by the department of bacteriology and biochemistry of the University of Maine, Orono. . . . A three-weeks' course in food technology will be given for engineers and chemists by Massachusetts Institute of Technology, Boston, begining June 13.*

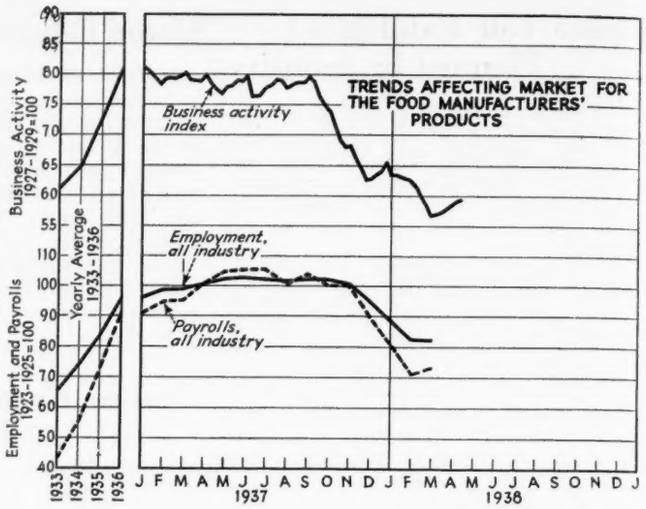
• Improvement in the quality of corn canned in Maine is reported as a result of quality grades established by the state. Canners are bearing the cost of a statewide inspection of raw material. . . . Better caviar is being shipped from Wisconsin as a result of inspection instituted by the state and cooperation of federal inspectors outside the state. . . . Rehabilitation of Florida's oyster industry is under way, and $500,000 will be spent on the project.

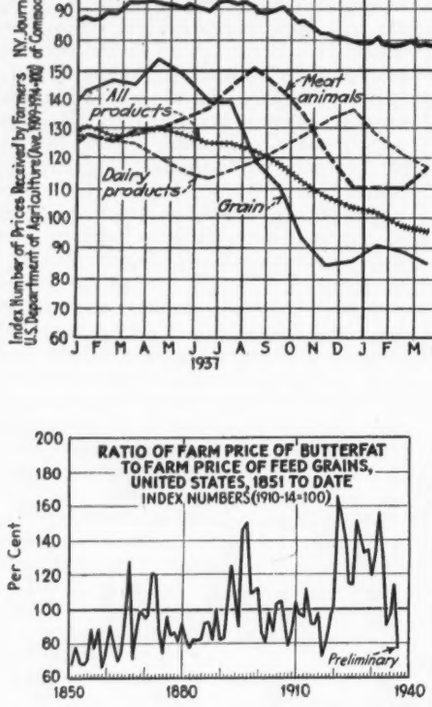
• *Indicative of the way the food industry is developing in the South is a recent report from the Alabama Industrial Development Board showing that two meat packers in Montgomery slaughtered 120,000 animals in 1936 as compared with 5,000 in 1919. There are a dozen other packing plants in the state, most of which were established in the last five years. . . . A city-wide milk cooperative which represents a direct partnership between milk consumers and dairy farmers will begin operation in New York soon. Known as Consumer-Farmer Milk Cooperative, Inc., it will sell grade B milk, only, through stores acting as agents for a fixed fee, at a price per quart 1 or 2 cents less than that of advertised brands.*

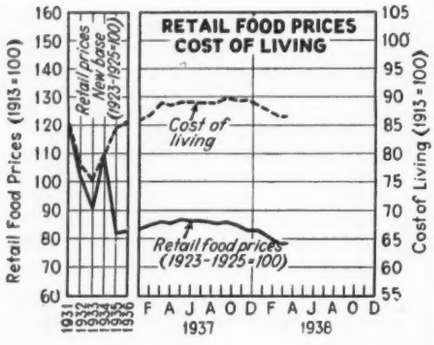
• Louisiana strawberry shippers are experimenting with dry ice as a booster refrigerant in cars precooled and iced with water ice. No re-icing is done in transit. . . . University of Idaho has completed an $8,000 potato-alcohol experimental plant at Idaho Falls. . . . A new hybrid tomato said to have remarkable qualities both for canning and as fresh fruit has been developed in Canada. It was perfected by John Janicky and Robert Rumball, of Toronto, and introduced through Dominion Research Laboratories. . . . Discovery of a new fraction of vitamin D has been announced by Dr. Charles E. Bills, Mead Johnson Co., Evansville, Ind.

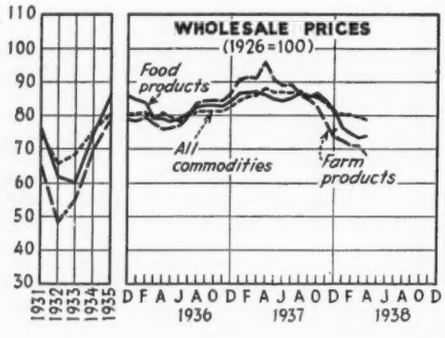
• *A new test to determine whether potatoes will cook white has been developed at Michigan State College, Lansing. A core no larger than a lead pencil is drawn from the center of the tuber and placed in alcohol. If the core retains its original whiteness, the potato will cook white. . . . Wyssbrod, Louisville, has applied for a patent on a method of curing Swiss cheese by repeatedly washing it with raisin wine and salt water during aging. . . . Proposed simplified practice recommendations covering inside dimensions of wooden boxes for use in shipping canned fruits have been submitted to industry by National Bureau of Standards.*


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
All products
Meat animals
Dairy products
Grain
Index Number of Prices Received by Farmers, U.S. Department of Agriculture (Aug. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Av. 1917-1919=100)
J F M A M J J A S O N D J F M A M J J A S O N D
1937
1938


TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Business activity index
Employment, all industry
Payrolls, all industry
Business Activity 1927-1929=100
Yearly Average 1933-1936
Employment and Payrolls 1923-1925=100
1933
1934
1935
1936
J F M A M J J A S O N D J F M A M J J A S O N D J
1937
1938







Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *Business Week*. The cost of living index is from the National Industrial Conference Board. The data on prices of butter fat and feed grains is from the U. S. Department of Agriculture.

BUSINESS TRENDS

Some Inflation Likely In Commodity Prices

Steps taken in Washington to increase expenditures for relief and public works, and to supply industry with easy credit, promise some upturn in commodity prices. While there seems little likelihood that any runaway inflation will be started, or that the inflationary measures will have much actual effect even on buying before some months have elapsed, the prospects are favorable for some stiffening in food commodity prices.

Acting as a brake on this tendency toward price increases, will be the prospect for abundant 1938 harvests. As evidenced in the recent federal forecast of the winter wheat crop, the general crop situation has been favorable, with sufficient rainfall over most of the main growing regions to promise abundant yields.

The month, from mid-March to mid-April, saw a further decline in the markets for important food raw materials. In that period, wheat dropped from 4 to 5 cents a bushel, flour fell 15 cents a barrel, lard decreased 45 cents a hundred pounds, eggs fell ½ cents per dozen and butter was off 3 cents a pound. Sugar, coffee and cocoa beans, among the imported products, also experienced price declines. In contrast, corn increased 3 cents a bushel; beaf, 1 cent a pound; pork ½ cent a pound; while lamb was unchanged.

Crop Board Forecasts Large Grain Crops

Winter wheat yield for 1938 was indicated by the Crop Reporting Board of the United States Department of Agriculture to be the best since 1931. A total of 725,707,000 bu. was shown by the Board's April 1 survey, which compares to an actual yield of 685,102,000 bu. in 1937, a low point during the drought of 350,792,000 bu. and the 1931 record crop of 817,962,000 bu.

This forecast is based on 57,492,000 acres sown last Fall, an abandonment of 13 per cent, and an average return of 12.6 bu. per acre. Last year the return averaged 11.9 bu. on a harvested acreage of 46,946,000 acres. The 1927-36 average return was 12.0 bu.

A bumper rye crop is also in prospect. The April 1 survey showed rye condition at 81 per cent of normal, compared to 71 per cent on the same date of 1937, and a ten-year average for the date of 78 per cent.

Weather Favorable To Large Food Output

An open winter and ample moisture have brought prospects of abundant yields of food crops. Grass was available for pasturage, even in the northern part of the country, until late in the Fall. And this Spring pastures were already furnishing considerable feed by April 15 in all states except the northern tier.

With this condition, milk output showed the largest March increase in fourteen years. Egg production per 100 hens also ran a high record for March.

Warm weather, as well as ample moisture, brought southern vegetables and fruits to northern markets as much as three weeks ahead of time, in March and early April.

In contrast, snow and cold in early April did severe damage to the fruit crop prospects in the Central West. Fortunately, most of the important fruit growing areas of other regions were not greatly affected. As a result, fruit crop prospects are now considered to be about average for the country as a whole.

Food Exports Increase While Imports Decrease

Exports of food products from the United States for February, 1938, were 75 per cent greater than in February, 1937, approaching the 40-million dollar mark for the second consecutive month. For the eight months ending with February of this year, food exports totaled $256,787,000, an increase of 77 per cent above the exports for the same eight months a year ago.

Contrasting with this increase, food imports for February, 1938, decline to $47,051,000, compared to $76,217,000 in February, 1937, a decline of 62 per cent. For the eight-month period ending with February of this year the decline in imports was 14 per cent, as compared to the same eight months of the preceding year.

Candy Sales Down

Sales of all types of confectionery and competitive chocolate products, for February, 1938, showed a decrease of 6 per cent below February, 1937. Figures were $20,011,435 this year and $21,279,415 last year.

When broken down into confectionery and chocolate sales, chocolate products showed an increase of 5 per cent for February of this year compared to February last year, while confectionery sales showed a decrease of 9 per cent when the two months are compared.

More Dairy Products Being Manufactured

Output of milk has gone up considerably during the first quarter of the current year. With this increase there has been an increase in the production of manufactured milk products, according to the figures for January and February, recently released by the United States Department of Agriculture.

Butter output for the two months totaled 225,556,000 lb., an increase of 8.2 per cent over the production of January and February, 1937. Cheese output was 57,713,000 lb. for the period, up 6.9 per cent over the production of the same two months in 1937. Evaporated milk output increased to 127,627,000 lb. from the 124,127,000 lb. recorded for the same two months a year ago, a rise of 2.8 per cent.

Construction News

	Pending (thousands)	Awarded April (thousands)	Total Awarded 1938 (thousands)
Bakery	$40	.....	$320
Beverages	130	$344	1,914
Canning and Preserving	.....	.....	115
Confectionery	.....	.....	.....
Grain Mill Products	175	40	40
Ice Manufactured	240	.....	260
Meats and Meat Products	470	150	1,329
Milk Products	325	120	350
Miscellaneous	772	1,140	3,194
	$2,152	$1,794	$7,522

Fewer Fish Frozen

Production of frozen fish in the United States for the calendar year 1937 was 6 per cent below the production recorded in 1936. In contrast, the 1937 figure was 12 per cent above the 1935 figure, and 26 per cent above that for 1934.

Output in 1937 was 168,224,000 lb. of frozen fishery products. Of this total, 22 per cent consisted of cod, hake, haddock and pollock; 11 per cent, whiting; 10 per cent, salmon; 9 per cent, halibut; and 8 per cent, rosefish.

In contrast, during 1937 the average monthly holdings of frozen fishery products was 63,810,000 lb., compared to 61,990,000 lb. in 1936; 52,201,000 lb. in 1935; and 48,492,000 lb. in 1934.

Business Still Uncertain

Brighter skies in Europe, inflationary steps in Washington, and the old spring upsurge, taken altogether, have hardly proved to be enough to heave up business out of its winter rut. By mid-April some indexes showed slight upturns and some others were still moving slowly downward. Moody's index, which stood at 149 on March 19, had fallen to 140 by April 9, and then had risen to 141.3 by April 16. Fisher's index performed in parallel fashion, being 82.3 on March 19, 80.9 on April 9, and 81.1 on April 16. The *Business Week* index of business activity registered an increase of 1.37 per cent for the four week period ended April 16.

Automobile production showed considerable upturn during the month, from 56,900 for the week ending March 26, to 62,021 for the week ending April 16. Steel production was almost constant for the month, although consumption of steel is slightly higher than production. Electric power production fell off slightly. Building construction was the bright spot, with commercial building at a six-year peak on April 14, according to *Engineering News-Record,* which also reported engineering construction for that week as 70 per cent above the corresponding week of 1937.

The United States Department of Labor indexes of wholesale prices of commodities, for the five weeks from March 12 to April 16, stood as follows: All commodities, down 1.50 per cent; farm commodities, down 3.90 per cent; and foods, down 2.03 per cent. For the four weeks from March 26 to April 23, the *New York Journal of Commerce* weekly index for wholesale prices in general fell 0.89 per cent. The same index for grains fell 2.24 per cent, while the food index fell 2.92 per cent.

INDICATORS

OLEOMARGINE sales for February, 1938, were reported by the Internal Revenue Bureau at 35,558,970 lb., an increase of 26.2 per cent over the sales for February, 1937.

FROZEN FISH HOLDINGS on March 15, 1938, were 45,674,000 lb., according to a report of the Bureau of Fisheries. This compared with 51,588,000 lb. on the preceding March 15, and a five-year average for the date of 32,480,000 lb.

SNAP BEAN canning acreage for 1938 has been reported to the Bureau of Agricultural Economics at 69,820 acres, up 1.8 per cent over 1937 planting.

FLOUR PRODUCTION in March, 1938, was about 1 per cent below that of March, 1937, according to the Northwestern Miller's report based on mills accounting for 60 per cent of output.

APPLES in cold storage, April 1, 1938, totaled 12,060,000 bu., compared to 7,360,000 bu. a year before, and a 1933-37 average for the date of 8,334,000 bu.

FROZEN FRUITS in storage, April 1, 1938, were reported at 98,833,000 lb., compared to 48,284,000 lb. on April 1, 1937, and a 1933-37 average for April 1 of 52,978,000 lb.

FROZEN VEGETABLES in storage April 1, 1938, totaled 23,792,000 lb., compared to 8,404,000 lb. on April 1, 1937.

BUTTER, creamery, in storage, April 1, 1938, was 14,310,000 lb. This compares to 6,700,000 lb. a year previous, and an average for April 1, 1933-37, of 8,399,000 lb.

EGGS, case equivalent, in storage on April 1 of this year totaled 4,029,000 cases, against 2,929,000 cases on April 1, 1937, and a 1933-37 average for the date of 2,624,000 cases.

POULTRY, frozen, all kinds, in storage April 1, 1938, was reported at 78,725,000 lb. On April 1, last year, 120,328,000 lb. was in storage and the 1933-37 April 1 average was 83,002,000 lb.

MEATS, cured and frozen, in storage on April 1 of this year were reported at 666,516,000 lb., compared to 1,022,539,000 lb. a year before, and a 1933-37 April 1 average of 777,431,000 lb.

LARD in storage, April 1, 1938, was 121,413,000 lb. On April 1, 1937, the figure was 217,227,000 lb., and the 1933-37 average for the date was 126,885,000 lb.

WEEKLY FOOD INDEX of Dun & Bradstreet stood at $2.37 on April 12, 1938, compared to $2.48 a month before, $2.53 on Jan. 4, 1938, and $2.89 on April 12, 1937.

MEN, JOBS and COMPANIES

INDUSTRY

» ATLANTIC QUICK FREEZE CO., INC., is completing a plant at New Bedford, Mass., to quick-freeze fish fillets and seafoods. To be ready for operation this month, the plant will have a capacity of 2,000 lb. of fillets per hour. The Z process will be used.

» BANFIELD BROS. PACKING CO., Tulsa, Okla., has acquired Miami (Okla.) Packing Co., thereby becoming one of the largest independent packers in the Middle West.

» BUCKEYE BREWING CO., Toledo, will carry out a $150,000 expansion and remodeling program.

» CAL-JUICES, INC., is building a $100,000 citrus byproducts plant at Anaheim, Calif.

» COLUMBIA ICE & COLD STORAGE CO. will open a $50,000 cold-pack plant at Wenatchee, Wash.

» CUSHMAN'S SONS, INC., is discontinuing its bakery business in Chicago. The company attributes this move to the impossibility, due to increased costs, of profitably manufacturing a product that meets with its standards of quality. A subsidiary of Purity Bakeries Corp., Cushman operated a baking plant, about 50 retail stores and some 40 door-to-door truck routes. The company will continue its retail business in New York.

» GENERAL BAKING CO. has abandoned operations at its bakery in Allentown, Pa., and will supply that area from plants in nearby cities.

» GENERAL FOODS CORP., New York, will erect a coffee processing plant and a general research laboratory at Hoboken, N. J., at a cost of about $1,000,000.

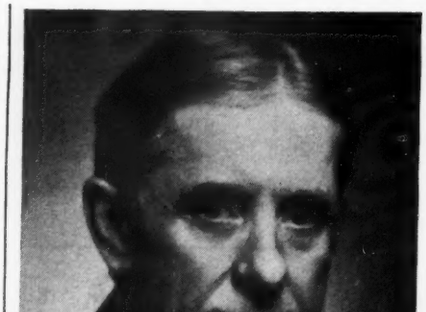
» KEYSTONE DAIRY CO., INC., has leased the Brown & Bailey Condensed Milk Co. plant at Potsdam, N. Y. The Keystone Co. is an operating unit of National Dairy Products Corp.

» MARIN DAIRYMEN'S MILK CO., Ltd., San Francisco, has started construction of a $500,000 plant with a capacity of 28,000 lb. of milk per hour.

» NATIONAL BISCUIT CO., is planning a modern new baking plant at Syracuse, N. Y., at an estimated cost of $350,000.

» PADUCAH KY. COCA-COLA BOTTLING CO. will spend about $140,000 to put up a new two-story bottling plant.

» PENNSYLVANIA SALT MANUFACTURING CO. has erected a hydrogen peroxide plant at Wyandotte, Mich. The bleaching agent will be made by an electrolytic method.



ARTHUR C. UNGER
Made trade relations supervisor.

WILLIAM M. ROBBINS
Becomes sales manager.

» PHILADELPHIA SMOKED MEATS, INC., plans to construct a new meat-products plant in Philadelphia. The cost is placed at $200,000.

» SAUNDERS MILL, INC., Toledo, had three buildings, all equipment and a large amount of raw materials and manufactured products destroyed by fire April 14, with a loss of $300,000.

» SEVEN-UP BOTTLING CO., St. Louis, contemplates a financing program involving about $200,000. The funds are to be used primarily for additional working capital.

» SNIDER PACKING CO., Rochester, N. Y., is constructing a freezing plant at Marion, Ind. Corn, peas, spinach and lima beans will be frozen.

» SUPREME SUGAR CO.'s refinery at La Badieville, La., was destroyed by fire on March 25 with a loss of about $500,000. The plant will be replaced by a new factory.

» SWIFT & CO.'s new packing plant at Lake Charles, La., began operation last month. Swift Canadian Co., Ltd., will build a $2,000,000 packing plant at St. Boniface, Man., Canada.

» WHEATLEY MAYONNAISE CO., INC., has established a new plant at Dallas, Texas.

» ZERO PACK CO. will operate a plant at Winchester, Va., to freeze strawberries, cherries, apples, blueberries, raspberries and blackberries.

PERSONNEL

» S. E. ABRAMS, Milwaukee, has been elected president of Wisconsin State Brewers Assn.

» Ross E. ANDERSON has been made president and general manager of Colonial Baking Co., Little Rock, Ark.

» WILLIAM T. BRADLEY has been elected chairman of the board of Ekhardt & Becker Brewing Co., Detroit. He was also renamed president and comptroller. William G. Breitmeyer, general manager, was elected first vice-president.

» E. E. CHASE, president, Richmond-Chase Co., recently was re-elected president of Canners League of California, San Francisco.

» W. P. DAVIS has resigned as general manager of New England Dairies, Burlington, Vt., to devote his entire time to activities of New England Milk Producers Assn. O. M. Sherbino, Bethel, Vt., is his successor.

» R. S. DICKINSON, vice-president of Nebraska Consolidated Mills, has been elected president to succeed M. R. Kinney.

» SANFORD V. EPPS, formerly manager for Clausen Baking Co. at Charleston, S. C., has been made manager of the Columbia, S. C., branch.

» P. R. GEYER, for the last eight years manager of the Cedar Rapids, Iowa, branch of National Biscuit Co., has been appointed manager of the Columbus, Ohio, branch to succeed Harry J. Richey, transferred to Cincinnati.

» F. E. GLOTFELTY, superintendent of the Argo, Ill., plant of Corn Products Refining Co., became manager of the company's Edgewater, N. J., plant on April 1. J. P. McCarthy of the Edge-

water plant has been made assistant to W. T. Brady, manager of the Argo plant.

» C. O. Holmberg, research chemist at the Omaha plant of Cudahy Packing Co., has obtained a year's lease to work as technical director in charge of the Campania de Productos Nacionales plant at Barranquilla, Colombia, where shortening and margarine are manufactured.

» George Huhn has been named manager of the Northern Milling Co., at Birnamwood, Wis., succeeding Alex Trantow, resigned.

» A. E. Johnson, Jacksonville, heads up Florida Dairy Products Assn. for the coming year.

» E. T. Kearney and John H. Sadler have been elected directors of Kroger Grocery & Baking Co., Cincinnati. Mr. Kearney is a partner of McKenzie, Wellington & Co., business consultants and accountants, and Mr. Sadler is assistant secretary-treasurer of Kroger.

» J. L. Kraft, president of Kraft-Phenix Cheese Corp., Chicago, has been elected a director of Stokely Bros. & Co., Indianapolis.

» John Lawanda, Detroit, recently was elected president of Michigan Bottlers of Carbonated Beverages.

» Oscar G. Mayer, Chicago packer, recently was elected chairman of the board of trustees of the University of Illinois.

» Charles E. Moyle has succeeded J. William Horsey as president of Standard Brands, Ltd., Montreal. Charles Cassie was elected vice-president and general sales manager. Both men were made directors.

» Adolph Orth has been elected president and general manager of Bechaud Brewing Co., Fond du Lac, Wis.

» William Reis has been named brewmaster of the new Alex Stegner Brewing Co., Louisville.

» Chris D. Rhem, New York, is the new president of New York State Bottlers of Carbonated Beverages.

» Herman A. Rosenbusch, brewmaster of Stroh Brewery, Detroit, and 1937 president of Master Brewers' Assn. of America, on April 7 was awarded the Max Henius Achievement Award of the Alumni Association of Wahl-Henius Institute.

» Edward S. Rutter, formerly with Larsen Baking Co., Brooklyn, N. Y., is now comptroller for Revlon Nail Enamel Corp., New York.

» E. N. Shurman, formerly vice-president in charge of the canned foods division of Geo. A. Hormel & Co., Austin, Minn., recently became general sales manager of Hiram Walker & Sons, Inc., Detroit.

» Bryce B. Smith has resigned as regional vice-president of General Baking Co., New York, to devote full time to his civic duties as mayor of Kansas City.

» George S. O. Smith has been transferred to the Valier & Spies Milling Corp.'s plant at St. Louis, as production manager.

» Henderson Supplee, Jr., has become president of Supplee-Wills-Jones Milk Co., Philadelphia. He formerly was general manager of the ice cream division. Mr. Supplee succeeds Frank A. Wills, who will serve as chairman.

» Homer Sutton and Stewart Gammon, both of Tulsa, Okla., have been appointed manager and superintendent, respectively, of the Miami (Okla.) plant of Banfield Bros. Packing Co.

» Arthur C. Unger, formerly sales manager of General Foods Sales Co., Inc., has been appointed to the newly created position of supervisor of trade relations. William M. Robbins, formerly eastern plant manager, succeeds Mr. Unger as sales manager. Harry W. Brown, in charge of the Battle Creek factory, takes Robbins' place as manager of eastern plants, and S. H. Zimmerman, former general superin-

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IN CANADA: ST. CATHARINES, ONT.

tendent of the Diamond Crystal Salt plant at St. Clair, Mich., succeeds Mr. Brown as plant manager of the Post Products Division at Battle Creek. P. W. Swan, superintendent of Calumet Baking Powder Division, Chicago, is transferred to New York as assistant to Udell C. Young, vice-president in charge of manufacturing and transportation. S. W. Braun, of Mr. Young's staff, succeeds Swan at Calumet. J. J. Thayer, western development engineer at Chicago is made general development engineer, with headquarters at Battle Creek. H. A. Gilbert, formerly eastern development engineer, stationed at Walter Baker & Co., Inc., Dorchester, is transferred to Battle Creek as Thayer's assistant.

» GEORGE P. WEAVER, Wilkes-Barre, has been elected president of Pilsener Brewing Co., Hazelton, Pa., succeeding Peter J. Noll. Other new officers chosen were Nicholas Yackanicz, Beaver Meadow, vice-president, and Martin Nemold, Old Forge, secretary-treasurer.

» WILLIAM WHITMORE has been made superintendent of the Holland Mills, Inc., Piqua, Ohio. He was formerly assistant superintendent of Allied Mills, Fort Wayne, Ind.

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More quickly adjustable wrapping machine

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With this new wrapping machine you can change from one size package to another in ten minutes flat—the change being made in all three dimensions of the package. All adjustments are made by handwheels conveniently located.

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Both of these packages are wrapped on a single FA machine—illustrating its wide size range.

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The Package Machinery Company, realizing the demand for versatility, has pioneered in adjustable wrapping machinery. Our wide knowledge of packaging problems can be of value to you in securing the right package for your product.

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DEATHS

» CHARLES H. BRACKETT, 73, proprietor of a large dairy in Greenland, N. H., March 23.

» WARREN W. CLUTE, 73, president of Watkins Salt Co., Watkins Glen, N. Y., April 7. Mr. Clute founded the salt company in 1889.

» LEONARD W. HATHAWAY, 76, president of Budlong Pickle Co. and former president of National Pickle Packers Assn., at Chicago, recently.

» JOHN F. HOWARD, 84, founder of Howard Salad Dressing Co., Haverhill, Mass., at Mexico City, recently.

» JOHN LUICK, 97, founder of the Luick Ice Cream Co., Milwaukee, March 30. He was the father of William F. Luick, president of Luick Ice Cream Co.

» CHARLES ROOD, 76, for 50 years operator of the Phalanx Flour Mill, Newton Falls, Ohio, April 4.

» MRS. JESSAMINE D. SHANNON, 61, president of Niagara Falls Milling Co. and Middleport Milling Co., March 22, at Lockport, N. Y.

» LESTER H. SMITH, 47, president of Smith Bros. Fisheries, Port Washington, Wis., April 15. He was division vice-president of American Fisheries Society and International Society of Fisheries and was vice-chairman of the Fishery advisory committee of the Department of Commerce.

ASSOCIATED INDUSTRIES

» COMMERCIAL SOLVENTS CORP., New York, has elected Major Theodore P. Walker president.

» FRANK G. FINDLEY, Milwaukee, vice-president of Canning Machinery & Supplies Assn., died March 26.

» FRITZSCHE BROS., INC., has opened a new branch office at St. Louis, Mo.

» HARNISCHFEGER CORP., Milwaukee, has elected H. S. Strouse vice-president.

» LIQUID CARBONIC CORP. has appointed H. J. Jones district sales manager in charge of the eastern division.

» SEFTON FIBRE CAN CO., St. Louis, announces the appointment of Ralph B. Busch as manager of sales.

» STEARNS MAGNETIC MFG. CO. has appointed E. C. Kiekhaefer chief engineer.

» WESTINGHOUSE ELECTRIC & MFG. Co., East Pittsburgh, Pa., has formed a new industry engineering department to centralize electrical engineering activities relating to central station and industrial power problems.

Finding Lost Man-Hours

(*Continued from page 267*)

Note: These answers will show the relation of the work movements to each other in the case under study: What movements are dependent upon other movements; what movements are independent of other movements; and what movements depend partially on other movements.

SECTION II—*Detail Questionnaire*

A. The number of men on the payroll. Their wage. The nature of their duties and the departments or jobs in which they are working for each hour in the day.

This information should tell the total number of men employed on actual productive operations and the number employed on non-productive work, for each hour of the day.

B. The total of production or goods handled, with the total of make-ready and clean-up work done, for each hour of the day, with the corresponding totals of man-hours of labor required.

C. Breakdown of operations, as to whether skilled, semi-skilled or unskilled labor is required to carry them out.

D. Information concerning the machines used in a day's run, including the total number of machines in use during each hour, and their style, size, make, rated capacity, and actual output under conditions of use.

In order to illustrate how the information on the work board and in the answers to the questionnaire is developed into colored charts which find lost man-hours and correct the loss, a brief presentation of a study actually worked out for a company pasteurizing and bottling milk follows.

This plant pasteurized and bottled 5,000 gal. of milk and 60 gal. of cream daily. It also churned the returned and sour milk from each day's run. The plant had eighteen men on its payroll doing the following work: receiving, bottle washing, pasteurizing, bottling, case piling, separating, churning, can washing, and cooling for storage. The hourly rate of pay averaged 50 cents, which, for ten hours, gave a daily payroll of $90.

The study was made to determine whether all the hours of work, that is, 18x10=180 hours, could be accounted for each day; whether this work could be done with fewer men by any rearrangement or balancing of the operations; whether, in this case, it would be necessary to speed up production; and whether it would be necessary to change the location or sizes of any of the machines.

In solving this problem, the first step is to insert colored riders in the pockets of the work board, as shown in Fig. 3. On each rider is marked the number of men who are working for that hour on that operation. The totals of the hourly columns then show eighteen men employed constantly for ten hours. This picture shown by the work board is then duplicated on a permanent chart of the ruled paper by means of the gummed colored strips, the number of men for each operation for each hour being written on each square, as on the work board. This is Chart No. 1.

Next, the work board is used to show the actual hours during which each operation was under way, as shown by the answers to the questionnaire. This arrangement of the work board is shown in Fig. 4 and is known as permanent Chart No. 2. For every possible rearrangement of the order of operations throughout the day, a set-up is made on the work board, and from this a permanent chart is made.

Chart No. 1 (Fig. 3) shows that, if the eighteen men were employed constantly for ten hours, then the

BUTTER YOUR HANDS

. . . Mr. Candy Maker, and let's pull some taffy.

No doubt you consider your high-temperature cookers are pretty hot . . . but:

Do they get hot as *quickly* as you'd like?

Do they stay uniformly hot (to a gnat's eyebrow) hour after hour?

Is control *automatic* beyond variations of human error?

Is your fuel bill high enough for you?

Other well known, big-volume candy makers, have turned to Kemp firing for the ultimate answers to these questions. Kettles fired with 100 percent *premixed* gas and air from the Kemp Industrial Carburetor are now establishing entirely new standards in automatically-controlled constancy, new flexibility and turn-down range together with an unprecedented fuel efficiency that invariably results in material reduction of fuel cost. The story of exclusive, patented Kemp premixing for high-temperature cooking, for roasting, baking, can-making, makes profitable (and interesting) reading for every food executive concerned with production. And we'll be glad to send it. Address the **C. M. Kemp Manufacturing Company, 405 East Oliver Street, Baltimore, Maryland.**

KEMP of BALTIMORE

nine operations must each continue throughout the ten hours to account for the labor of these men and justify their employment. But Chart No. 2 (Fig. 4) shows that this was not the case. This chart is made from actual operations, as given in the answers to the questionnaire, and shows that nine men were working from 7 to 8 a.m.; eleven men from 8 to 9 a.m.; eighteen men from 9 a.m. to 12 noon; sixteen men from 12 noon to 2 p.m.; and twelve men from 2 to 5 p.m.

Whereas Chart No. 1 shows 180 man-hours paid for, Chart No. 2 accounts for only 142 man-hours. This is a loss of 38 man-hours, or an effective use of but 78.8 per cent of the payroll.

Search for the 38 lost man-hours shown by Chart No. 2 is made in the light of the answers to the questionnaire. In the case used here for illustration purposes it was found that receiving time could be shortened from seven to five hours, as also could can-washing and cooling for storage. The operating hours for pasteurizing could not be shortened or shifted, as was also the case with bottling and case piling. Bottle washing showed possibilities of rearrangement, but this was not done at this point of the study. Churning was moved to the hours of 12 to 4, and separating to the hours 12 to 3.

This rearrangement on the work board is shown by Fig. 5, and is made into permanent chart No. 3. It is an arrangement requiring but sixteen men to operate the plant instead of the original eighteen. The payroll under it would be $80 instead of $90. But the chart shows that only 134 man-hours are accounted for under this arrangement. So there is still a loss, this time of 26 man-hours, giving an effective use of 83.7 per cent of the payroll.

The next step in the case used for illustration was to study the operation of bottle washing, which was untouched in making Chart No. 3. The operation was partially dependent upon bottling. It could be stopped (under the milk plant regulations in the city where the plant was located) at any time when sufficient bottles were washed and stored to allow completion of the day's bottling. It was found that, by having enough washed bottles on hand to take care of the bottling requirements for the hours 9 a.m. to 12 noon, bottle washing could be stopped during those hours. And into this now vacant time, it was possible to shift the separating.

With this information, the work board was set up as shown in Fig. 6, and permanent Chart No. 4 was made. In this new chart, it is seen that thirteen men can be hired to operate the plant so that the payroll is now reduced to $65 per day for 130 man-hours. Of these man-hours, 119 are used, so that the loss in man-hours has been reduced to eleven and effective use is made of 91.55 per cent of the payroll.

In this particular plant no additional changes could be made. The lost man-hours were reduced by the study to the lowest point that could be attained, in view of the necessary relations between the operations.

This method of finding lost man-hours and eliminating the loss as far as is possible, can be used in any type of manufacturing plant. The example from the milk pasteurizing and bottling plant was selected because of its relative simplicity. But the same form of graphic analysis can be applied to any case, provided the necessary information is collected and the procedure outlined in this article is followed. In this connection it should be noted that as many permanent charts should be made as are necessary to show each step in the analysis and study.

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Markets for Baked Goods
(*Continued from page 273*)

uct, with an increased appeal for those who are able and willing to pay for the refinement. The constructive thing for the baking industry to do is, therefore, to follow this trend, and refine the flavor-quality of their products in relation to the purchasing power all along the line, instead of forcing a greater consumption of the minimum quality products to absorb the purchasing power. There is decidedly a potential market for improved quality bread products, in addition to the cake varieties. The fact that, according to the estimates based on the sales of the past five years, 32 cents of every dollar spent for bakery products went for cakes, indicates that the consumer is able to absorb better grade bakery products, and that the constantly increasing ratio for cakes is due to the fact that the bread bakers have failed to make the necessary qualitative improvement that would attract the higher purchasing power.

It is also estimated that, of the half-billion-dollar value of home baking and other competitive foods which have been supplanting commercially baked foods, $400,000,000 represents luxury products. This means that, of the combined actual and potential market, about 52 per cent is SPENDABLE on bread and cake, above the present "Standard" quality as produced by the baking industry.

This is the most important fact established by this summary survey.

The real problem is the development of ways and means of achieving the goal—the capture of this potential consumption yet outside the reach of the commercial bakers. This demands a critical but a constructive analysis of the basic causes of why the industry has failed in the past to reach this potential consumption.

One reason is the absence of correlated and pertinent marketing and economic facts. The unrelated study of the consumption of staples is not the measure for the baking industry, and yet this was all that the industry has used for years. Next, the producing, operating and merchandising methods—well intentioned, to be sure—are nevertheless against the interest of the industry.

There has been a decided over-application of the blessing of chemistry and mechanical efficiency as well as of merchandising. Thoughtless and frequently destructive competition has been behind such over-application. Under such circumstances, manufacturing costs have been under constant pressure to create new savings which, however, were not plowed in for the betterment of the quality of the product but used to meet the constantly mounting costs of distribution and merchandising.

These forces compel the exertion of every effort for cost reduction and the lengthening of the merchantable life of the product, with the "Ford" method as their ideal. The "Ford" method and the consequent "standardization" is excellent for the automotive industry, but it is fatal for bakeries. This is not a sermon against the mechanization and mass production of bakery products, but against its inelastic application. It is a protest against the "biggest-loaf-at-lowest-cost" policy, which is suicidal to the industry, when more than HALF of the consumers can afford to buy products better than the irreducible minimum quality.

The same unwise policy has been manifested in the merchandising methods, started by the larger bakers and, of course, followed by smaller bakers down the line.

The packaging fever hit the industry very hard. The original demand was for a simple sanitary measure,

Something NEW in FOOD STARCHES!

Manufactured under our patented processes in our modern refinery, these starches offer you new and distinctive properties.

They have *no cereal taste* of their own—hence, better palatability. They set to a smooth, creamy consistency—firm, but without objectionable "pastiness." They have all the desirable features of starches costing considerably more—and, at the same time, definite advantages found in no other starches.

Special grades are available for Dessert Preparations, Pie Fillings, Salad Dressings, Caramels, and similar products. We invite inquiries from food manufacturers, and shall be glad to send one or more trial bags entirely on approval, from our nearest factory.

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the prevention of unsanitary handling of bread between the producer and ultimate consumer. Instead of meeting the requirements as simply as possible, the bakers permitted themselves to be oversold on packaging. What has been the ultimate result? Bread has lost its most valuable selling assets, the visual and olfactory appeals. It became just another form of packaged merchandise. Wrapped and double wrapped, hermetically sealed. In other words, a product intended for a 24-hour consumption turn-over has been equipped for a lengthy endurance test. Merchandise, piled upon the grocery counter like cord wood, with all the splendor that printer's ink can provide.

One of the outstanding problems for this industry appears to be the immediate correction of misuses of packaging. It costs many dollars every year, reducing the potentialities of profit, not to mention the fact that it conceals much of the character and flavor which the baker originally put into his product. Many other avenues are open to the industry to meet the sanitary requirements without obscuring the appealing character of its products.

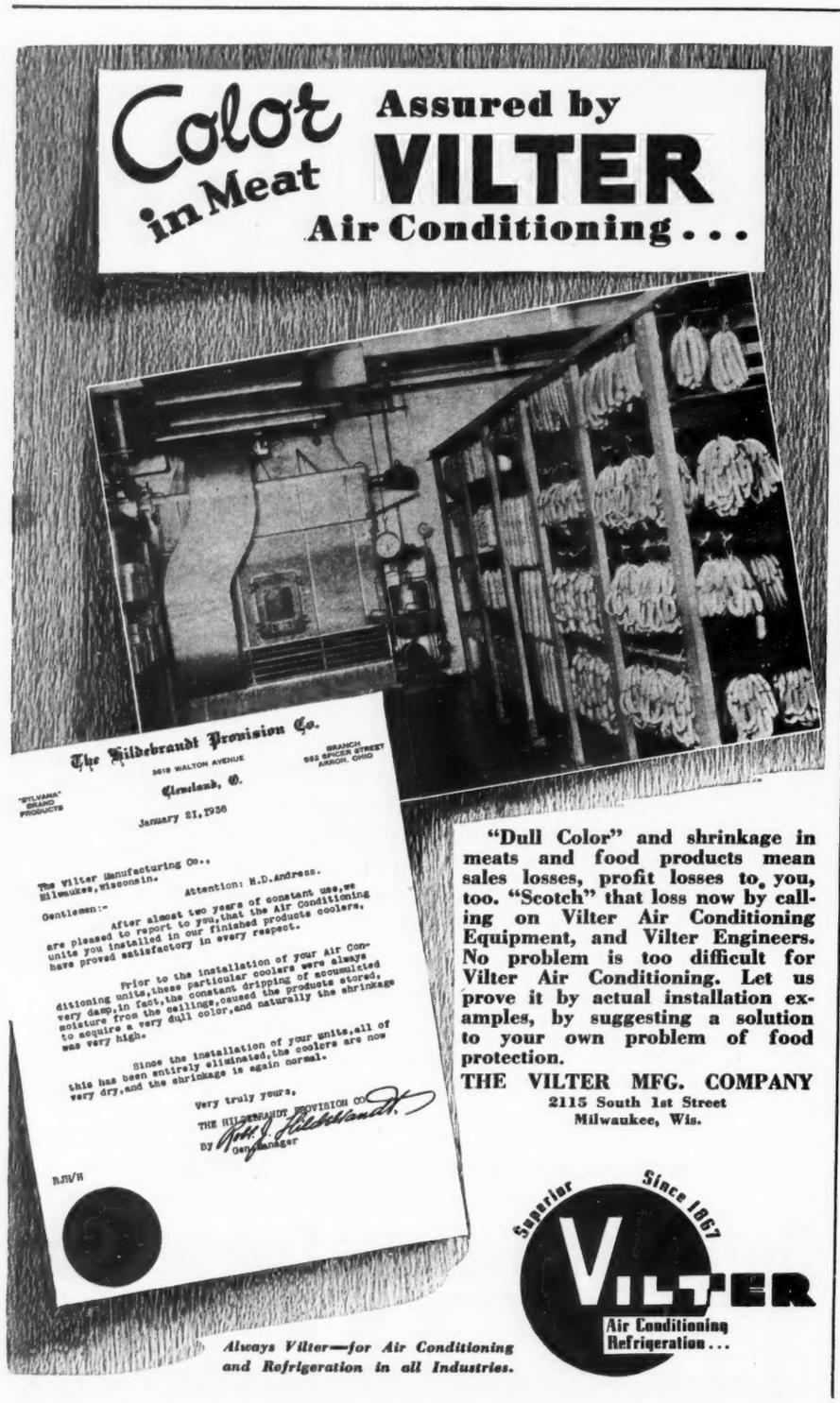
This packaging problem has also a twin sister, pre-slicing, another illusonary "improvement." The demand for sliced bread was artificially created by the merchandising genius, looking desperately for some means of "sales stimulation." It meant no improvement in the quality of the product, but it sliced away with every loaf another fraction of profit from the industry.

When reflecting over the decreased unit consumption of their products, bakers will do well if they cast a critical eye upon this "packaging-slicing improvement." It made bread last longer but it did not add a single element to the quality of the bread. Nor did it increase consumption. It did not add a single penny to the profits of the industry but, on the contrary, it reduced profits.

Let us accept without argument that the unhandled delivery of bread from producer to consumer is an essential sanitary measure, prescribed usually by law. This could be accomplished by other methods, cheaper, better and without a single disadvantage either to the baker, grocer or the consumer. For instance, bread might be packed into substantial, yet inexpensive paper bags especially constructed for the purpose in standard sizes for 10, 15 and 25 loaves. The distributor could be provided with attractive, sanitary, and moisture-tight display cases. The package could be placed in the case and then, with the assistance of a rip cord, the wrapping could be eliminated. It would require no unusual mechanical ingenuity to provide a simple device that would deliver the loaves directly into the grocer's paper bag, untouched by human hands. This method would satisfy the modern sanitary requirements and would provide the broadest opportunities for a constructive sales promotion by the exploitation of modern display methods, preserving all the virtues of appearance and quality which the baker originally put into the product. And, in the bargain, it would save substantial sums of money annually to the industry. This is only one of the many possibilities.

An argument frequently used in favor of packaging is, that it provides an identity and brand recognition which otherwise would not be possible. This is not necessarily so. This identification and brand recognition could be more cheaply accomplished by branding the bread itself, by the simple procedure of stamping the brand, either in a convex or in a concave embossing of the baking pan.

(*Turn to page 310*)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Prior to the installation of your Air Conditioning units, these particular coolers were always very damp, in fact, the constant dripping of accumulated moisture from the ceilings, caused the products stored, to acquire a very dull color, and naturally the shrinkage was very high.
Since the installation of your units, all of this has been entirely eliminated, the coolers are now very dry, and the shrinkage is again normal.
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VILTER
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Always Vilter—for Air Conditioning and Refrigeration in all Industries.

Accidents to Women

(*Continued from page 278*)

and strength of body are not peculiar to set areas, and so a reasonable choice of employees can be made. Excitability, age, health, intelligence, and strength are factors on which the employer can have an opinion, and it should be exercised. In the long run, a careful choice will affect the accident record.

It should be a responsible function with someone in the plant to see that "hand-to-mouth" hiring is not substituted for careful and intelligent choice of employees. Choice of employees will, in fact, help very definitely on the point I have used as an illustration. Women do slip and fall more readily than men. They have, on the average, less sense of physical control than men have. It is a point peculiar to them, and it is an important one to the accident record.

Just as it is important to hire men who can deal with and handle men successfully, so is it important to have supervision by women who understand, have sympathy for, can freely deal with, and successfully handle women. Women, singly or in the aggregate, are sometimes a puzzle to men, so choose women supervisors, and do so with judgment and on a plan. Accidents are peculiar to many women because many women are peculiar themselves. That is why they wear peculiar footwear and clothing, and are hard to wheedle or guide away from the habit. Only good female psychology will make progress. Women, too, sometimes impose on men; they hide behind their sex; and discipline is just as needed with them as anyone else. They must be understood to be disarmed and led.

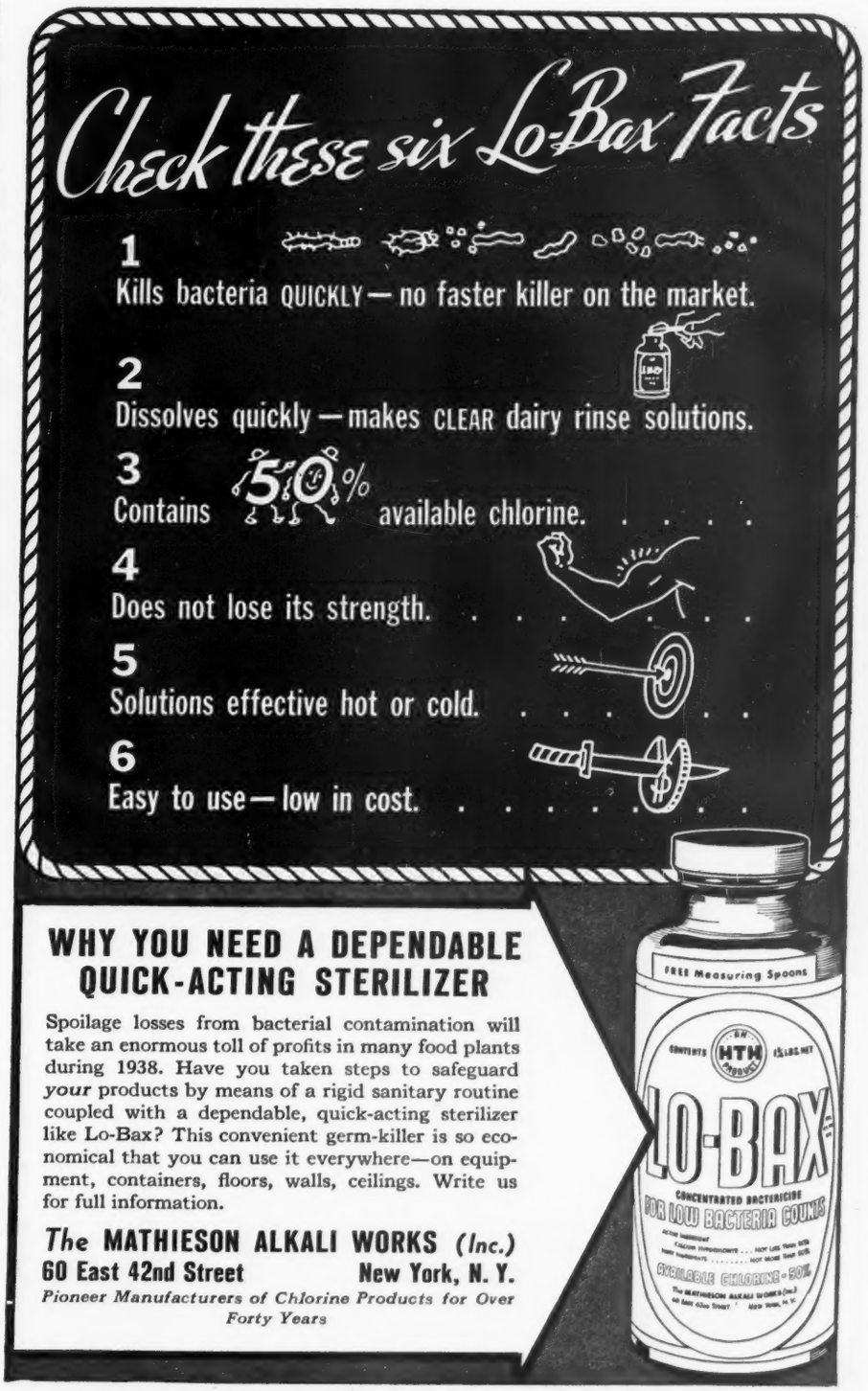
Fatigue affects women more quickly than men, as a rule. That is why there must be rest periods, fatigue-reducing seats, and such allied details. Any old seat won't do. A tired woman with a lame back may be a costly problem on your hands. Footwear also plays a part in fatigue.

Supervision, among other things, should see that women are not unduly rushed, and do not carry loads beyond their capacities. The age of the women is a factor to be considered. We have found that younger women are steadier on their feet, while older women are more reliable and stable on dangerous machinery.

As a business question, a safety organization should be an operating function of the plant. Women should be represented on the safety committee. In order that any plan may be successful there must exist, of course, a spirit of loyalty. I think that a very good way to promote loyalty is to include the interested parties in the plan. It is generally a good idea to work prospective offenders on the safety organization committees, to make them safety conscious.

The question of organization must be attacked on the basis of a broad organization, however, and not just as an organization for women alone. That attack involves clearly a need for knowledge. There can be no science where there is no knowledge.

Gather your knowledge with a close regard for the underlying factors; be without prejudice; follow your information so as to get the truth, and not what you would like to get; and when you get the truth, put it to work. But when you put it to work with women, remember that you are dealing in some instances with accidents that *are* peculiar to women. The underlying factors which differentiate men from women, so far as accidents are concerned, clearly are not the absence of intelligence; no lack of loyalty or obedience. They rest mostly with physical circumstances, emotional flares, and dress habits.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Does not lose its strength.
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Solutions effective hot or cold.
6
Easy to use—low in cost.
WHY YOU NEED A DEPENDABLE QUICK-ACTING STERILIZER
Spoilage losses from bacterial contamination will take an enormous toll of profits in many food plants during 1938. Have you taken steps to safeguard your products by means of a rigid sanitary routine coupled with a dependable, quick-acting sterilizer like Lo-Bax? This convenient germ-killer is so economical that you can use it everywhere—on equipment, containers, floors, walls, ceilings. Write us for full information.
The MATHIESON ALKALI WORKS (Inc.)
60 East 42nd Street New York, N. Y.
Pioneer Manufacturers of Chlorine Products for Over Forty Years
FREE Measuring Spoons
HTH
LO-BAX
CONCENTRATED BACTERICIDE
FOR LOW BACTERIA COUNTS
AVAILABLE CHLORINE - 50%

Are Industrial Wastes Liabilities?

(*Continued from page 271*)

widespread study. Recovery of salable byproducts is encouraging; treatment of residual wastes is feasible and practical.

In this brief review of the status of some industrial waste problems, it is apparent that such wastes are almost universally liabilities to the sewer authority, but they may not be liabilities to the manufacturer. After entrance into the sewer, hope of profitable recovery practically vanishes. Therefore, industry should exhaust every possibility of recovery within the factory by establishment of research groups of chemists and engineers charged with the responsibility of determining what improvements of processes and recoveries of materials may be accomplished. The time is short before pressure for alleviation of pollution by industrial wastes become urgent. National legislation may not condone local complacence; therefore, if industry has to spend money for waste treatment, it would be wise to start now to study how such wastes may be diminished.

In one plant we know it cost only 18/100 of a CENT per BARREL to eliminate this costly pest

This flour producer has overcome his losses from insect infestation by fumigating his plant with LIQUID HCN four times a year. When this 2500-barrel mill operates at capacity for 200 days a year, the annual cost is only 18/100 cent per barrel — an insignificant expenditure to effect great savings.

Another food company, producing prepared cake and flour mixtures, uses HCN in its vacuum chamber fumigation. The chamber is loaded with 40,000 pounds of packaged product at a time.

In this plant a complete kill of all insects and their larvae is obtained at a cost of 15/1000 cent per pound of packaged product.

Neither of these two companies has sustained losses from insect infestation nor have there been returns on insect-infested products.

If you handle flour, rice, raisins, dates, figs, nuts, cacao, or other food products subject to insect infestation, why not write us for an estimate of the cost of obtaining a complete kill of destructive pests.

LIQUID HCN is an all-purpose pest destroyer. It is a powerful, concentrated, economical and efficient fumigant, completely controls all insects which infest stored products, and kills rats and mice.

As the only manufacturer of HCN in all its modern forms —including LIQUID HCN (commercially pure), ZYKLON DISCOIDS and CYANOGAS—American Cyanamid is in position to render a complete and valuable service.

AMERICAN CYANAMID & CHEMICAL CORPORATION

Insecticide Department

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

KANSAS CITY MO. AZUSA, CALIF.

Markets for Baked Goods

(*Continued from page 308*)

This would identify the brand in the consumer's home until the last slice is used up. Furthermore, this method of application could be successfully employed for the elimination of the pre-slicing procedure. Indentations pressed into the sides of the pans could indicate on one side the proper slicing thickness for toast and the other side for sandwiches.

There are so many sound arguments against indiscriminate packaging and pre-slicing of bread that, with improvements of this kind, the public acceptance of unwrapped and unsliced bread in the hands of competent publicity men could be successfully promoted.

NOW A FEW WORDS ABOUT CAKE. The effort of many bakeries to capture the higher share of the purchase dollar through the cake line has also been attempted through over-emphatic trick-packaging and splash displays, instead of through quality of products. The results are self evident. In spite of the lavish and expensive packaging procedures, the industry has hardly made a dent in the tremendous potential market for luxury products, because not even the trickiest packaging can replace quality which tastes, smells, and looks to the average consumer as good as the home-made product. The luxury lines provided by the large producers, particularly, carry too conspicuously the ear marks of mass production to compete successfully with the consumer's own creations.

How changes in the make-up of the population and in occupation really effect bread consumption will be shown in Part III of this article, which will be published in FOOD INDUSTRIES *for June, 1938.*

Curing and Packing Cheese

(*Continued from page 280*)

aging and the greater the evaporation loss. Aging in a valve-vented can permits aging up to a temperature of 60 deg. F. This greatly shortens the aging period without evaporation losses. Rind does not develop in the valve-vented can. Probably the most important advantage gained from the use of the valve-vented can for aging cheese is that it permits packaging and merchandising cheese free from rind, in a sanitary uniform sized consumer package carrying the identifying label of the manufacturer, and a minimum cost of packaging materials.

BOOKS RECEIVED

BAKER'S CAKE BETTER THAN THE HOUSEWIFE CAN MAKE. Published by Brown's Hungarian Corp., 23 Beaver St., New York, N. Y. 1937. 32 pp.; 5⅛x8¼ in.; heavy paper. Free.

As the subtitle, "Ready-Reckon Recipes," indicates, the text of this booklet is largely a compilation of recipes for 22 varieties of cake and other bakery products made with soft flour.

However, the manner in which this information on cake making is presented justifies the classing of the booklet as being something more than a recipe book. It is a work book.

First of all, the user of the book is advised on the importance of critical selection of all ingredients to be used and is briefly informed as to the technical progress that has been made during recent years in the manufacture and preparation of all these ingredients, not merely of the flour alone. Also included is a warning as to the importance of handling and storage of the ingredients.

All the ingredient portions for each recipe are given in terms of 100-oz. and 100-lb. batch weights. They are in an easily read type and a tabulated work-card form, with mixing-method directions, depositor or work-bench technic suggestions and batter, as well as bake-oven, temperature ranges.

Perforations in, and the double-strand wire binding of the card-like leaves permit the open book to lie flat on the work bench and the leaves to be easily turned.

GRAPHIC ROUTES TO GREATER PROFITS. By John Walter Esterline. Published by The Esterline-Angus Co., Indianapolis, Ind., 1938. 312 pages; 8¾x11½ in.; copiously illustrated with graphs and pictures; heavy paper; heavy cloth binding. Price $3.

The first essential in efficient and low cost operations is to learn what machines, men, and processes are doing. Then their weaknesses may be spotted and steps taken to eliminate them. And in the food industries there are other reasons than low cost for desiring a graphic picture of operations. Graphs are needed to check the performance of the various steps in the process. This is important if the manufacturer wants to control his quality and keep it at a high level. Still another purpose served by charts of process times, temperatures, pressures and other variables is to avoid payment of fraudulent consumer claims for damage due to spoiled or contaminated foods. So in the food industries this book might also be called recorder routes to better products.

While the publishers of this book are manufacturers of electrical instruments, the book is not a publicity puff but a compilation of case histories of the things that have been accomplished by the use of graphic instruments. There are 239 of these, covering problems of power, machines, processes, men and products. Power (particularly steam) costs are an appreciable factor in the cost of processing foods. The selection of the proper types and sizes of machines, such as individual motor drives, is important for sake of economy. Efficient operation of machines is no less important. And supervision and check up of the work of laborers in many food plants is difficult because many times they do not work in gangs under an overseer; while a graphic meter can not be attached to a man to measure his productivity, one can be connected to the motor driving the equipment which he is operating. No food technologist will deny the importance of accurate graphs of the process variables in the improvement of old processes and in development of new ones.

Several of the 239 case studies are from the food field. They tell, for example, how the Cunningham Grain Co., Malden, Mass., saved over $100 a month by reducing peak power loads; how Bowman Dairy Co., Chicago, induced workmen to reduce maximum power demand charges in several plants; how Arcady Farms Milling Co., Riverdale, Ill., knocked $10,000 a year off the power bill by studying power losses, motor capacities and peak demands; how a large southern packing company induced workmen to remember to turn off lights in the coolers; how a large Chicago dairy discovered that it ought to operate two synchronous-motor-driven ammonia compressors so that one is on suction stroke while the other is on compression to reduce the peak power load; how power supplied to the motor driving a bread mixer can be used as a measure of the density of the batch and to show when the different ingredients are added, the mixer stopped and the dough dumped; how a northwest flour miller saved $3,240 in added labor cost by using a graphic record of the power consumption of bag cleaning machines to determine that the men operating them were loafing on the job.

ANNOTATED LIST OF THE INSECTS AND MITES ASSOCIATED WITH STORED GRAIN AND CEREAL PRODUCTS, AND OF THEIR ARTHROPOD PARASITES AND PREDATORS. By R. T. Cotton and N. E. Good, Bureau of Entomology and Plant Quarantine. 81 pages; 5¾x9¼ in.; paper. Price 10 cents; for sale by Superintendent of Documents, Washington, D. C.

WINE OF CALIFORNIA. Published by the Atchison, Topeka & Santa Fe Railway Co., 1937. 36 pages; 5¼x7½ in.; board. Free. A brief, popular account of the history, production and use of California wines, beautifully printed and illustrated.

BEER AND BREWING IN AMERICA—AN ECONOMIC STUDY. By the late Warren M. Persons, former Harvard University professor. Published by United Brewers Industrial Foundation, 21 East 40th St., New York, N. Y., 1937. 48 pages; 6x9 in.; paper. Free. An authoritative birds-eye picture of the economic aspects of beer and brewing.

BIG BUSINESS: ITS GROWTH AND ITS PLACE. Prepared under auspices of the Corporation Survey Committee of, and published by Twentieth Century Fund, Inc., 330 W. 42nd St., New York, N. Y., 1937. 102 pages; 5¾x8¼ in.; cloth. Price $1.35.

Findings of a study, the object of which was to determine just what niche "big business" fills in the economic life of America.

DRYING KIEFFER PEARS AND THE USE OF THE DRIED PRODUCT. By C. W. Culpepper, Bureau of Plant Industry. 24 pages, 6x9 in. Price 5 cents; for sale by Superintendent of Documents, Washington, D. C. Technical information on preparing the fruit and on processing and packing it, with data covering shrinkage, composition, storing, uses, etc.

Correction

In a review of "Laboratory Manual —Methods of Analysis," published in the March Issue of FOOD INDUSTRIES, this manual of American Butter Institute was listed as being free. Actually, there is a charge of $1 per copy to those not members of the Institute and of $0.75 to members.

PATENTS

Pork Butts and Similar Irregular Meat Pieces Stuffed Into Tubular Flexible Casings at Spaced Intervals Longitudinally to the Casing and Casing Twisted Between Each Butt to Exert Pressure on the Butts for Shaping Into Compact Smooth Masses Preliminary to Smoking and Solidification of the Compressed Butt by Contraction of Casing During Smoking—Herbert Rumsey, Jr., Nutley, N. J. No. 2,107,166. Feb. 1, 1938.

Candy Pulled on a Double Action Mechanical Puller—Alphonse Poirier, Dutton, Mont. No. 2,107,213. Feb. 1, 1938.

Food-Containing Packages Given Steam Exhaust Box Treatment During Passage Through Vapor-Tight Sealing Machine—Lynn E. Davies to White Cap Co., Chicago, Ill. No. 2,107,237. Feb. 1, 1938.

Beet Molasses Mash Containing Grain Alcohol Distillery Slop or Corn Germ Meal and Soluble Non-toxic Phosphate Fermented by Bacteria of the *Closteridium sacchro-acetobutylicum* Group—David A. Legg, Terre Haute, and Noble R. Tarvin, Brazil, Ind., to Commercial Solvents Corp., Terre Haute, Ind. Nos. 2,107,261 and 2,107,262. Feb. 1, 1938.

Fruit Diced by Mechanical Means—Herbert E. Gray, San Jose, Calif. No. 2,107,293. Feb. 8, 1938.

Doughnut Cooking Machine—Charles E. Carpenter, Chicago, Ill. No. 2,107,325. Feb. 8, 1938.

Meats Shaped Into Predetermined Forms While Cooking Under Pressure—Stanley F. Gleason, Philadelphia, Pa. No. 2,107,329. Feb. 8, 1938.

Animal Fat Rendered and Hydrogenated While Moving in Sheet Form in Semi-Fluid State Between Two Electrodes—Lloyd H. Reyerson, St. Paul, Minn. No. 2,107,505. Feb. 8, 1938.

Brewer's Malt Adjunct Made in Dry Lump Form From Corn—Walter R. Fetzer, St. Louis, Mo., to Union Starch and Refining Co., Columbus, Ind. No. 2,107,529. Feb. 8, 1938.

Beverages Carbonated by a Tablet Whose Essential Ingredients are an Alkali Carbonate and an Acid Formed Into Alternate Layers and Coming Into Intimate Contact With Each Other Only at Juncture of Layers—Clarence Edward Beck, 47 per cent to Albert T. Hanby, eight per cent to Blanche Beck and five per cent to James H. Tait, Philadelphia, Pa. No. 2,107,550. Feb. 8, 1938.

Spices and Dry Flavoring Herbs Sterilized by Cyclic Treatment With Heat Under Reduced Pressure and Ethylene Oxide for a Total of About 3½ Hours—Carroll L. Griffith and Lloyd A. Hall to Griffith Laboratories, Inc., Chicago, Ill. No. 2,107,697. Feb. 8, 1938.

Pretzels Made by Mechanical Means—Earl W. Curtis, Canton, Ohio. No. 2,107,749. Feb. 8, 1938.

Bulk Dried Fruits Mechanically Separated Into Individual Pieces and Manipulated While Moving on a Conveyor Under Pressure for Reduction in Thickness of Pieces—Clifford B. Pape and Elisha N. Thayer, San Jose and Theodor A. Schwarz, Menlo Park, Calif. No. 2,107,798. Feb. 8, 1938.

Yeast Enzymes Influencing Reproduction Stimulated to Greater Activity by Irradiation in a Condenser Field of 150 Milli-Amperes Intensity Ranging From Four Meters to Fifteen Meters Wave Length—Paul Liebesny and Hugo Wertheim, Vienna, Austria. No. 2,107,830. Feb. 8, 1938.

Butter Made in Churn Constructed to Equalize the Churning Load by Dividing and Equalizing the Churning Strain on the Plow Shelves on the Inner Surface of the Rotating Body and Against the Walls and End of Churn—Frank G. Clark, Minneapolis, Minn. No. 2,108,162. Feb. 15, 1938.

String Beans Snipped During Passage Through a Rotating Cylindrical Shell Perforated to Permit Ends of Beans to Protrude Through and be Cut Off by Knife Extending Longitudinally the Length of the Cylinder—Frank P. Ryder, deceased, by Stephen M. Ryder, executor to Chisholm-Ryder Co., Inc., Niagara Falls, N. Y. No. 2,108,179. Feb. 15, 1938 and No. 2,110,242. March 8, 1938.

Hops Exposed to Wave Lengths of Light Lying Above 4900 Angstrom Units During Air Curing—Mayne R. Coe, Washington, D. C., to the Government and the People of the United States of America. No. 2,108,305. Feb. 15, 1938.

Ice Cream and Similar Frozen Confections Packaged in a Cone Shaped Paper Cup—Norman M. Thomas, Brooklyn, N. Y., to Joe Lowe Corp. No. 2,108,418. Feb. 15, 1938.

Liquid Foods Processed in Jacketed Unit Equipped With an Agitating Means and Baffled so as to Give the Liquid an Up and Down Movement as Well as a Horizontal Stirring One—Otto W. Greene, Elyria, Ohio, to Pfaudler Co., Rochester, N. Y. No. 2,108,482. Feb. 15, 1938.

Peaches Freed of Pit by a Mechanically Actuated Knife—Percy Jepson, to Pacific Machinery Co., San Jose, Calif. No. 2,108,535. Feb. 15, 1938.

Acid-Precipitated Casein Mixed Under Pressure With Water and a Filler Preliminary to Extrusion and Subsequent Mixing With an Alkali and Water to Form a Liquid Casein Product—Henry V. Dunham, Bainbridge, N. Y. No. 2,108,582. Feb. 15, 1938.

Corn Popping Put Under Automatic Control—Herbert B. Tyler, Evanston, Ill. No. 2,108,627. Feb. 15, 1938.

Fruits and Vegetables Freed From Spray Residues by Treatment With Dilute Solution of An Inorganic Acid Containing a Small Quantity of an Alkali Metal Salt of a Compound Obtained Through the Reaction of Sulfuric Acid and Aliphatic Alcohol and a Diphenyl—Thomas S. Carswell, Kirkwood, Mo., to Monsanto Chemical Co., St. Louis, Mo. No. 2,108,763. Feb. 15, 1938.

Taro Meal Given a Three Stage Heat Treatment From 250 Deg. F. to 350 Deg. F. to Prevent Reversion to an Amorphous Viscous Mass When Hot Liquid is Added—Gaston J. Ley, John H. Payne, and George Akau, Honolulu, Hawaii, to the free use of the People of the United States. No. 2,108,897. Feb. 22, 1938.

Unshelled Pecans Given Bleaching Treatment and a Subsequent Dyeing, Washing, and Drying Which Identifies and Permits Separation of the Imperfect and Low Quality Nuts From the High Quality Ones and Improves the Appearance of the High Quality Nuts—William Potter Bullard, Albany, and James Samuel Guy, Atlanta, Ga., to National Pecan Growers Exchange, Albany, Ga. No. 2,108,915. Feb. 22, 1938.

Dressed Animal Carcasses Freed From Base Portion of Pizzle—Charles F. McKim, to Industrial Patents Corp., Chicago, Ill. No. 2,108,921. Feb. 22, 1938.

Flour Blends or Mixture Components Proportioned in Desired Quantities by Automatic and Synchronized Deposition in Successive Layers Onto a Belt Conveyor Carrying a Layer of Flour From the Bottom of a Flour Bin Under a Series of Separate Compartments Containing the Other Components of the Blend or Mix—Leslie J. Sisley and Frank J. White to Fisher Flouring Mills Co., Seattle, Wash. No. 2,108,999. Feb. 22, 1938.

Cheese Slices Packaged in Air-Tight Film Covering Made of Wax Rubber Composition—Joseph Rossman and Charley L. Wagner to Marathon Paper Mills Co., Rothschild, Wis. No. 2,109,093. Feb. 22, 1938.

Ice Cream Packaged Into and Frozen in Distortable Receptacles in a Manner to Prevent Bulging or Distorting of Container From Predetermined Shape—George W. Cocks, Upper Montclair, N. J., to Marathon Paper Mills Co., Rothschild, Wis. No. 2,109,102. Feb. 22, 1938.

Cream, Chocolate or Jellies Deposited on Biscuits in a Manner to Vary the Thickness of These Deposits—Leonard Marsden, Newton-le-Willows, England. No. 2,109,336. Feb. 22, 1938.

Tomatoes Freed From Juice in a Continuous Manner by a Rotating Screw Operating Inside a Cylindrical Screen Permitting Ready Draining of the Juice—Willard C. McNitt, Winnetka, Ill. No. 2,109,398. Feb. 22, 1938.

Buns Sliced by Mechanical Means—Robert R. Springer, one-half to William W. McKinney, Harrison, Ark. No. 2,109,438. Feb. 22, 1938.

Sugars Recovered From Molasses Through Treatment of the Molasses With a Sugar Dissolving Organic Liquid and Gaseous Ammonia—Gustave T. Reich, Philadelphia, Pa. No. 2,109,503. March 1, 1938.

Dextrose Hydrate Separated From Converted Starch by Slow Motion Crystallization Operation—Charles J. Copland, North Kansas City, Mo., to International Patents Development Co., Wilmington, Del. No. 2,109,585. March 1, 1938.

Pectin in Sol Form Given an Acid Treatment to Change the Setting Time of the Pectin Without Destroying the Gel Characteristics of the Pectin—Gordon Manley Cole and Raymond Edward Cox, Corona, Calif., to California Fruit Growers' Exchange, Los Angeles, Calif. No. 2,109,792. March 1, 1938.

Frozen Confections Freed From Rods of a Portable Carrier by Passing an Electric Current Between the Rods and Through the Frozen Confection—Robert F. Eddy, Long Beach, Calif., to Joe Lowe Corp., New York, N. Y. No. 2,109,822. March 1, 1938.

Cream Line in Homogenized Milk Held at Desired Level by Removal of Cream Prior to Compressional-Wave Homogenization and Subsequently Adding the Desired Quantity of Cream—Edward W. Smith, Melrose, Mass., to Submarine Signal Co., Boston, Mass. No. 2,109,912. March 1, 1938.

Powdered Pectin Standardized as to Gel Strength Through Addition of Predetermined Amount of Alcohol-Extracted Fruit Fibers and Small Amount of Pectin-Dispersing Agent—William A. Rooker, Martinsburg, W. Va. No. 2,109,950. March 1, 1938.

Curd Tension of Milk Lowered to Soft Curd Value by Addition of Small Quantity of Treated Milk to Major Quantity of Hard Curd Milk—Edward W. Smith, Melrose, Mass., to Submarine Signal Co., Boston, Mass. No. 2,110,115. March 1, 1938.

Foods in Liquid State Dehydrated by Spraying Into Tower Structure—Robert T. Northcutt, Cranford, and Andrew Langstaff Johnston, Jr., Plainfield, N. J., to Food Concentrates, Inc., New York, N. Y. No. 2,110,167. March 8, 1938.

Fruits Dehydrated to High Degree of Hardness by Application of Heat and Low Pressure to Convert the Fruits Substantially to an Anhydrous Crystalline Form—Earl N. Percy, to Dry Fruit Products Co., Oakland, Calif. No. 2,110,170. March 8, 1938.

Fruits Dried and Puffed by Application of Heat Under Varying Pressure Conditions to Produce Puffing—Wells A. Webb, Wilmington, Calif., to Dry Fruit Products Co., Oakland, Calif. No. 2,110,184. March 8, 1938.

Multiple Band-Blade Bread Slicing Machine—Harry J. Criner, one-half to A. G. Bush, Davenport, Iowa. No. 2,110,290. March 8, 1938.

Egg Meats Forced Through Large Area Fine-Mesh Screen in Bottom of Large Capacity Tank by Pressure of Gas Injected Into Top of Tank—Marvin C. Reynolds, Chicago, Ill. No. 2,110,384. March 8, 1938.

Fresh Flesh Products in Cold Storage Protected From Desiccation and Freezer Burn by Wrapping in Oil-Impregnated and Wax-Coated Paper—Severin O. Westby and William E. Lund, Seattle, Wash. No. 2,110,410. March 8, 1938.

Fish Cutting Machine—Edward David, Carmel, and Stephen Szody, Seaside, Calif. No. 2,110,416. March 8, 1938.

Fermented Egg White Foam Adjusted to a pH of 4.7 to 6.9 and Mixed with a Proteolytic Enzyme to Form Liquid Albumin—Theodore L. Swenson, Chevy Chase, Md., to the free use of the People of the United States of America. No. 2,110,613. March 8, 1938.

Tuna, Clams, and Oysters Protected Against Bacterial and Enzyme Action Prior to Canning by Heating and Subsequent Refrigeration—Lawrence T. Hopkinson, Washington, D. C. No. 2,110,801. March 8, 1938.